AGRI-FOOD

A LOOK AHEAD

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FOREWORD

The publication of the proceedings from the Agri-Food: A Look Ahead Conference is intended to communicate to a wide segment of the agri-food sector, the substance of discussion which took place November 1-2, 1988. It summarizes the comments of guest speakers and their responses to questions from the audience. It also contains the background paper, 'Agri-Food Outlook and Policy Review,' prepared by the Economics and Policy Coordination Branch of the Ontario Ministry of Agriculture and Food for distribution at the Conference.

The theme of the Conference was "The Next Hundred Years." Prominent speakers focused on specific issues, trends, opportunities and problems that will shape Ontario's agriculture and food sector over the next century. This theme was chosen because 1988 marked the Centennial anniversary of the Ministry. During the Centennial year the Ministry focused attention on past achievements and future directions. At the conference the Minister, the Honourable Jack Riddell presented Centennial Awards to Maryon Brechin, Peter Hannam, Ken McKinnon and George MacLaughlin. In addition, tokens of appreciation were presented to the selection panel for the Centennial Awards.

The Conference was attended by producers, farm association representatives, marketing board members, food processors, wholesalers, retailers, and trade associations, as well as legislators, bankers, investment dealers, academics, lobbyists and the media. In total 440 individuals attended the conference.

The problems, policies and strategies raised by the speakers alerted participants to the changing circumstances affecting their products, provided alternatives for addressing those challenges, and encouraged awareness and understanding of the viewpoints and positions of various segments of the agri-food sector. The wide range of delegates increased the scope of the discussions and provided agri-food decision makers with additional insights into the rapidly changing environment in which the industry operates.

Future Conferences will have different themes, but each will continue this process of communication among the various segments of the agri-food community.

Additional copies of this publication can be obtained by writing to:

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Welcome and Introduction

JACK RIDDELL
Minister
Ontario Ministry of Agriculture and Food

I do want to welcome you all to the 1988 Look Ahead Conference and welcome you to the beginning of the next century of agriculture in Ontario. It is gratifying to see such a large turnout of all sectors of the industry here today who are interested in helping us to steer the ship over the next hundred years.

In Roman mythology the God Janus was considered the God of beginnings and custodian of the universe. Janus was portrayed as having two heads back to back. One to look backwards to the past, the other looking forward to the future.

As members of the agriculture and food industry we too are like Janus. We are custodians of agriculture. We are marking a new beginning and we do so by reflecting on the past in order to plan the future. Throughout the Ministry of Agriculture and Food Centennial year we have had the opportunity to look back over the century of agricultural achievements in Ontario. Sometimes we were amazed by the foresight and advances made in the industry, other times we were amused at the way things were done and by the attitudes of the times. But above all, we learned.

To put history into perspective is not always easy, and appreciating progress is sometimes difficult for us who have been fortunate enough to have lived in these times. Just think about the incredible technological advances that took place in the span of a hundred years since 1888. We can all take pride in the fact that the agriculture and food industry in Ontario is a $15 billion a year industry and that Ontario remains the leader in Canadian agriculture. However, we cannot afford to rest on our laurels.

The reality is, and it is no revelation to anyone here, that agriculture and food is a constantly changing, highly competitive, global industry. We can be proud of our achievements, but we cannot afford to be complacent. In as much as we have been adopting new technology and food production and processing, so have our competitors in the United States and South America and in Europe. More than ever, the agriculture and food industry has become a high stakes game with international government policies changing the rules and food production subsidies upping the ante all the time. So as 1988 draws to an end, we begin to look ahead to the next century of what we all hope will be another 100 years of achievement.

I can't help but wonder what things will be like when the Ministry celebrates its bicentennial in 2088. With technology advancing as quickly as it is at present, food might be grown hydroponically in space stations orbiting our planet, or it might be synthetically produced and taken in pill form. I, however, am not a futurist but I am a realist and an optimist like many Ontario farmers. Rather than supposing a "Star Trek" image of agriculture and food in five or ten decades, I would instead prefer to make a few observations on the immediate future, at least to the year 2000 based on developing trends.

Any amount of future gazing is basically a risk, even more so for a Minister. Winston Churchill was once asked, what were the essential qualifications of public service? He said, "the ability to foretell what will happen tomorrow, next month, and next year and to explain afterwards why it didn't happen." I can relate to that quite well but for this morning I will take my chances.

The three areas of agriculture and food that will present challenges, and that will require immediate attention and planning on our part, are: research, the food processing sector, and the environment. These three areas are like the agri-food industry as a whole. They are spokes within a wheel; distinct and separate, each with a function but working in concert to achieve a goal. That goal is our ability to stay ahead of international agri-food competition by producing high quality, safe, cost efficient food that meets the needs of consumers worldwide while sustaining and protecting our irreplaceable environment.

I believe our commitment to the future of this industry is perhaps nowhere more evident in the emphasis that we put on research. Ontario's annual budget for agricultural research is $42 million a year, the largest commitment of this kind by any Canadian province. That budget is dedicated to developing the new technology and methods of production that are the lifeblood of this industry. There is also the powerful but relatively underdeveloped side of research related to biotechnology.

Genetic engineering and biotechnology have the potential to make today's accepted management practices obsolete. We may one day control pests without chemicals at all or build in resistance in cows so that they do not develop mastitis. In fact, my Ministry's scientists told me that by the year 2000 they expect to see commercially viable plants resistant to disease and insects available on the market. They also tell me that by the turn of the century, plants will be dramatically different from the ones that we grow today. We will soon have the potential to tailor plants and animals to the environment in which they are raised and to improve our food production system. Believe me, these are not pipe dreams of scientists.

Biotechnology and research are making things happen. Just last March, the University of Guelph

and the Ontario Veterinary College introduced the first bovine vaccine to control shipping fever. The value of this vaccine for bovines is equivalent to finding a vaccine for the common cold in humans and is invaluable to the cattle industry the world over. It was discovered here in Ontario. Biotechnology and related research is the way of the future for agriculture. Currently, hundreds of biotechnology experiments occur throughout Canada at private companies and at universities.

The Ontario Government supports biotechnology through a special project established in 1986. The five year agriculture and food research fund, as it is called, sets aside $10 million for research that is of a more innovative, high risk and nontraditional nature. It specifically encourages researchers to target their work at existing or anticipated markets. Right now, 67 projects have been funded under this program. Beyond this highly specialized research, the Ministry is also very committed to funding agricultural research and programs that can respond to the new preferences of our food consumers - which brings me to the second area.

We, in the Ministry and in Government, have identified as a crucial, high growth industry, the food processing sector. Earlier this year, the Premier's Council produced a report entitled "Competing in the New Global Economy." The Council has identified resource based industries such as food processing and forest products and mature manufacturing industries such as steel and automobiles as the core industries of Ontario's economy. However, every one of these has been facing competitive pressures from several areas. In the resource industries such as food processing, the pressures have come from slower growth in traditional markets for our products, from the exploitation of new low cost resources in other countries and the resulting need for Canadian firms to add more value to our farm and food products so as to remain competitive, domestically and globally. Should the free trade agreement be implemented, segments of Ontario's food processing industry will be at a further disadvantage in competing against massive U.S. firms with large economies of scale. This means a revitalization of our food industry is essential to remain competitive.

The report of the Premier's Council, together with my Ministry's ongoing monitoring and analysis of the food processing industry in Ontario, has helped us to focus on some important issues. They have reinforced the need to re-evaluate the marketplace and restructure in the name of competitiveness. As a government, we cannot, and should not be solely responsible for the policies and programs that will keep us in the forefront of competitiveness. This goal can only be achieved through partnership with the industry. I believe that we must work with the Ontario farm sector and the food processing sector to plan a course for economic survival. This fact must be particularly recognized in Ontario where 40 percent of all Canadian food production originates. All sectors of the industry must combine their efforts to seek markets in Canada, North America, and all other countries and to respond to consumer demands.

What foods will be in demand in the year 2000? I would like to extrapolate on the shifts in consumer profiles and preferences we see today. Most food experts stress the importance of quality and nutrition to the consumer. Many predict that people will find that quality at home. There will be a strong movement back to cooking at home. A renewed interest in foods like mother used to make, with the quality of the ingredients being significantly better than today's. Other food professionals see a general consumer consciousness raising about health, metabolic and chemical reactions to food and other scientific developments. It is also predicted that consumers particularly over the age of fifty, will approach food in a more proactive way as a means to extend life through healthy eating. Ontario food firms will have to respond with products that are ready-to-eat, microwavable, smaller portioned and containing fewer calories. Therefore, the trend to further value added and ready-to-eat food products will continue. These products will have to be of higher quality and targeted to smaller market niches. The degree of competition will increase and thus force cost efficiencies and enhance marketing efficiencies.

To meet this increased competition, the industry will become more technology driven. Research and development spending must grow as future technologies will include robotics, biotechnology, microelectronics, extrusion cooking, vacuum packing and new packaging materials. At present, we are examining ways that would allow food industries to provide input in the government decision-making. As a government, we need help in reviewing the many areas of our assistance to the food processing industry. Included in these are the effectiveness and future of capital assistance programs, skills training, research and education, and technology transfer programs. I also see the need for the government to examine our legislative framework to ensure that we have the highest standards in order to provide top quality products for our customers.

I would say that quality, safe food and standards to gain consumer confidence in what we produce, are the foundations for future success. More and more consumers are voicing their concerns over residues in the food they eat and the effect of agricultural chemicals on the environment.

The Ministry of Agriculture and Food is well aware of these concerns and has initiated a new program called, Food Systems 2002. Many of you are probably aware of this program that aims to reduce the quantity of pesticides used by Ontario farmers by 50 percent over the next 15 years. While doing this we aim to maintain efficient and sustainable crop production, with an emphasis on developing environmentally sound pest-control techniques. Food Systems 2002 does not propose to do away with pesticides but instead places emphasis on the responsible use of pesticides. We realize that crop protection chemicals are necessary for efficient, large-scale production of high quality food. However, we

also realize that the continued intensive use of pesticides can lead to soil and ground water contamination and a general deterioration of environmental quality.

Farmers as users of pesticides are also concerned about the environmental impact of their practices and the possible effects on their own health. In response to this, the Ministry has hired four pest management specialists under the Food Systems 2002 program to explain and accelerate existing pesticide safety courses to growers. We anticipate that during the next five years, up to 35,000 growers will be trained in the safe handling of pesticides. As well, an annual $800,000 research allocation over the next five years will fund specific research.

The concern for environmental quality and human health will increase in the years to come, while our reliance on pesticides will not decline greatly in the immediate future. However, the way we use pesticides will continue to change. I see a greater use of integrated pest management techniques, the challenge is to use chemical, biological, cultural, physical and regulatory controls in the right combination, tailored for specific crops. There is room for future success, but to achieve it we need to focus on research. The Ministry is also examining its role in assisting the livestock industry with its concern over drug residues. As consumers want and demand higher quality products, it is vital that government and industry work together to achieve a safe and nutritious food supply.

Years from now, I am sure we will look back on the late 1980's as the beginning of the wider all-encompassing environmental consciousness. The protection of our resources, of our wildlife and our children have become election issues in Canada and the United States as well as an issue of primacy in the United Kingdom and the Soviet Union. We see and read about environmental issues everyday, from toxic waste to the depletion of ozone to the greenhouse effect.

Ten years ago would world attention be captured by the plight of trapped whales under Alaskan ice? Would you imagine the international rescue teams working together to save two grey whales? It is happening and it is capturing our attention because we as a society have finally realized that this is a fragile world in which we live and more than that we realize that we are not masters of the earth but are merely guests. We are stewards of the earth and we have a responsibility to protect that which gives us life.

In Ontario, we have seen a renewed interest in the concept of land stewardship. Our farmers have been enthusiastically supporting the concept that the preservation of our agricultural lands through responsible farming practices is a major factor in ensuring the long term sustainability of our valuable resources and our food industry. To encourage and support this viewpoint the Ministry established the land stewardship program. There has been widespread interest in several sections of the program such as crop rotation, conservation tillage, residue and crop cover and reforestation to help conserve our natural resources of soil and water while still permitting an economically viable farm operation.

All of the forces I have noted will place increasing stress on the skills, abilities and management of Ontario farms, processors and retailers. These changes will also mean adjustment in the structure of our industry. I am not one to complain about change and given how this industry has adapted so far, I do not fear it. The agricultural industry has met these challenges of the past and will do so again.

However, contrary to the views of some, I believe that the family farm, the keystone of our primary agricultural industry, will remain intact. The ability of Ontario farmers to adapt, to build upon their past successes and to overcome obstacles is centred on the rejuvenating ability of the family farm. This is one heritage we cannot and must not lose. This is why many of the programs and policies of my Ministry are geared to helping farmers to help themselves.

I intend to maintain this commitment to the entire industry. I am confident that the new way of thinking on the farm, in the city, in government, and industry has already begun. We in Ontario are fortunate to have safe food and enough of it. If the agricultural and food industry is to survive, and to excel, in the next one hundred years, we must plan today. By we, I mean all sectors of the agricultural and food industry in Ontario. The grower, the laboratory researcher, the transporter, the processor, the packager, the marketer, the distributor, the grocery and ultimately the consumer. I am not much of a fortune-teller but I do feel optimistic that advances in food growing and processing technology and continued research and development coupled with the responsible use of our resources will provide the answers for a competitive industry tomorrow. Working together, we can be ready when the world turns twenty-one.

BIOGRAPHY

JACK RIDDELL

Jack Riddell was appointed Minister of Agriculture and Food by Premier David Peterson on June 26, 1985 and was reappointed on September 29, 1987. He was first elected to the Ontario Legislature as the Member for the riding of Huron-Middlesex in a by-election on March 15, 1973.

A graduate of the Ontario Agricultural College at the University of Guelph, Mr. Riddell has a strong background in agriculture. He has extensive experience as a sheep and cattle producer, and owns a 200-acre cash crop farm in Huron County. In addition, he has provided services to farmers as an assistant agricultural representative of OMAF and has taught agriculture at the secondary school level.

Global Agricultural Prospects

GERALD I. TRANT
Executive Director
United Nations World Food Council

Fourteen years ago this month the United Nations held a World Food Conference in Rome. A great deal of importance was attached to the event and most countries were represented by their Ministers of Foreign Affairs and Agriculture. In the two previous years, grain harvests had been poor in several countries, supplies were short and prices had risen spectacularly. Even in constant value dollars they had more than doubled. It was widely believed at the time that there were only 20 days of food left on the planet. Increased agricultural production was considered a necessary condition, and perhaps the most important action for the decent survival of the world's people. In particular, grave doubts were expressed about the ability of the Indian sub-continent to feed itself. Many believed that the required increases in food production were simply not possible. As a result of the World Food Conference, the United Nations created two new agencies - the World Food Council and the International Fund for Agricultural Development. More about them later.

Two years ago, in 1986, 12 years after the United Nations World Food Conference, our human family had increased by one billion. The world was producing more food than ever before, there was more than enough food to feed all the world's people. There were many hundreds of millions of people that did not have enough to eat. Grain stocks were at record levels and grain prices were only a third in real terms of prices in the early 1970's. Farmers dependent on world markets lost money as a consequence of falling product prices and increasing costs, particularly interest rates and fuel costs. Losses were especially heavy for those producers who had bought land at a time when land prices had been bid up in the expectation that there would be a continuance of the favourable grain prices of the early 1970's.

This year, unfavourable weather conditions in North America, China, Bangladesh and Africa have resulted in a decline of grain stocks to tighter supply levels and some improvement in prices. Once again, people are beginning to ask - can the world produce enough food to feed us all?

When production and prices are in somewhat violent motion, it is difficult to take an accurate sighting until things calm down a bit. However, despite the recent fluctuations of price and quantity with which we are all familiar, the long-term trend of grain production is up - as is consumption. The long-term trend for grain prices is down, and has been for many years. There is every expectation that the trend will continue as known production technology is applied and new, more productive technology is developed. I would expect the basic long-term secular trend in grain prices to continue well into the next century. I would also expect that the trend will be masked from time to time by short-term price variability caused by regional, natural or man-made disasters. Over-production of basic agricultural products is frequently attributed not only to the application of production-increasing technology but also to the financial support provided by industrialized countries that both permit and promote the application of such technology.

Two observations are relevant. The first of these is that many, if not all, agricultural price support programs were put in place originally simply because farmers were already producing more than markets were willing to pay for at remunerative prices. That is prices that would pay the acquisition costs of all resources used in production. Since the First World War, according to at least one author, agricultural producers in the United States of America appear to have received remunerative prices, including government support, in only eight or nine years - slightly more than one year in ten.

The causes of over-production are clearly more complex than high support prices alone. How long will this over-production continue? I think that the long-term decline in constant dollar prices of grain will continue well into the next century.

There have been many forces shaping the development of world agriculture over the past hundred years. Today I can only look at a few of them, and even that examination will be incomplete. Hopefully it will be useful.

Technology has made three types of well-recognized contribution to agriculture resource productivity. Labour productivity has been increased enormously by the development and application of highly efficient, highly specialized, highly priced and mostly petroleum-powered machinery and equipment. This machinery and equipment has not only enhanced the productivity of human labour, but it has also provided services that labour is incapable of performing. Its effective use has been made possible by a large investment in the physical capital that agricultural machinery represents in itself and in the other machines and equipment required to service it and keep it running when needed. The physical capital would be of little use were it not for the complementary investments that have been made in the training of people to use and maintain it. Mechanization of agriculture took place primarily in the industrialized world. It was the industrialized countries that produced the machines and provided the financing that allowed farmers to buy them. I do not think it is necessary to belabour the point that most of the benefits and a good portion of the costs

of farm mechanization were received by the industrialized world. By almost any reasonable standard, the typical farm in the developing world is under-mechanized. The size of developing world farms precludes the use of large machines and their typically tenuous financial basis makes purchase of equipment difficult - if not impossible. But perhaps the strongest reason discouraging the developing world in its acquisition and use of farm machinery is that a great deal, in fact most of developing-world agriculture, is subsistence farming existing virtually outside the market system.

Attempts by developing-country governments to promote farm mechanization without an adequate service component have been discouraging.

Mechanization can be expected to continue on the industrialized world's farms, but at a slower rate than previously. A rapidly-mechanizing Third World agriculture does not appear to be in sight. Farm mechanization was only one of the contributions of technology to increased agricultural productivity. It is not only the stock of physical capital represented by machinery and equipment that makes our agriculture productive, but also the stocks of biological capital represented by improved plants and animals.

Plant breeders have been particularly successful in increasing the yields of vitally important food crops such as wheat, rice and corn. Their work has been complemented by a host of other production specialists, including plant physiologists, entomologists and weed-control specialists. As you all know, the greatest successes in improving wheat and rice yields in the last 30 years have been under conditions of intensive irrigated production involving high-yielding, non-lodging varieties, high fertilizer levels and pesticides. The evidence indicates that without these improved seeds and production practices, the countries of Asia would not have been able to feed their growing populations. The importance of these improved varieties of wheat and rice is difficult to overestimate. They, along with effective national efforts, have permitted many of the countries of Asia to increase food production faster than their populations and even provide emergency stocks. Most of the benefits of higher-yielding wheats and rices and their production packages have gone to Asia, and to a lesser degree to Latin America. There is little evidence of comparable results in Africa. Africa is still waiting its green revolution, although there are some that would say that there is a significant development in Cassava in Nigeria, but the evidence is not all in yet.

In the case of corn, the record is not as clear. In North America and Europe, yields have increased strongly and steadily for many years. The yield increases are due to a number of factors - improved breeding, increased fertilizer use, and better weed and pest control. In the developing world, some improvements in corn yields have been made, but they are in no way comparable to the increases in yields realized for rice and wheat. One of the more interesting recent developments is a breakthrough made in Brazil that has resulted in a corn variety that will produce high yields on the aluminium toxic soils of the Cerrada. This will mean a very large increase in the land available for corn production in Latin America.

So far, the distribution of benefits from improved varieties of rice and wheat appear to have been in favour of the developing world, although the North has benefited to some degree as well. Most of the benefits from improved corn varieties have stayed in the industrialized world.

For the future, the picture is a bit more obscure. To be sure, new varieties of wheat and rice will continue to be developed, and the improved varieties will be grown over a wider area. So far, however, it seems that the limited area of land that can be irrigated in the developing world will be an effective barrier to the expansion of high-yielding varieties. Unless significant increases in yields can be obtained for crops produced under rain-fed conditions, the costs of increased food production will increase dramatically when the opportunities for new irrigation works have been exhausted. One of the problems that the world faces in increasing the area under irrigation is the fact that, as a result of poor planning and/or construction, many irrigation works have resulted in the salinization of previously-productive soils. Currently new irrigation works are barely offsetting the land losses resulting from the salinization of badly-constructed and poorly managed old ones.

A third major area of contribution of technology to increase agricultural production has been that of agricultural chemicals, in particular, fertilizers and pesticides. In fertilizers, there have been many developments in the last hundred years that have improved the form, timing and placement of the major and minor elements. Possibly the most important recent development from the point of view of increasing the yields of wheat, rice and corn has been the use of jet engine compressors in reducing the cost of producing nitrogen fertilizers. There can be little doubt that it was this technology in particular that permitted the genetic material of the high-yielding varieties of rice, wheat and corn to be translated into increased yields on farms around the world.

Of equal, or perhaps greater, importance than fertilizers in increasing farm output have been the insecticides, herbicides, fungicides and other types of pesticides that have liberated food crops from the devastating effects of insects, weeds and disease.

In the last forty years, the use of agricultural chemicals has increased many times. In terms of fertilizers, the heaviest users have been Europe, followed by North America. The developing world has increased fertilizer and pesticide use, but not to the degree that has been possible for the industrialized nations.

For the future, there is little doubt that the use of agricultural chemicals will have to be continued and increased in order to feed the world's current and prospective population. There will also be increasing

pressure brought to bear on farmers everywhere to use agricultural chemicals in an environmentally sound way. Integrated pest control, using biological rather than chemical means to control pests, will continue to be a much-sought-after objective.

However, the problems associated with developing effective, biological controls for the range of pests that reduce the yields of food crops appear to be very difficult to deal with. While I might expect some progress in this area of research, it does not appear to offer an effective alternative to chemical controls.

In aggregate, the dynamic forces of new technology may be expected to expand agricultural production world-wide for many years to come. The benefits are not expected to be evenly distributed.

One of the more important determinants of the way in which these benefits will be distributed around the world is population growth and I believe it is important to comment on this issue.

Human population grew slowly during most of the last ten thousand years. On average, it took a thousand years each time for the population to double. In the past hundred years population growth has increased dramatically. At the turn of the last century there were nearly 1 billion people on earth. It took only until the 1920's, for the number of people to double. By 1950 there were 2.5 billion people on earth and by 1987 that number had doubled. There are now more than 5 billion of us on our planet and it is expected that there will be more that 6 billion by the turn of the century.

There is some indication that the global population growth rate is declining from the 1.9 percent per year of the last 37 years. But the time when the global population will stabilize will depend on the time by which the fertility rate reaches the replacement level. Thus, if replacement level fertility is achieved as soon as 2010, the world's population will stabilize at less that 8 billion people in 2060. If, however, it takes until 2065 for replacement level fertility rates to be met, then the world's population is expected to reach a stable level of more than 14 billion at the turn of the twenty-second century. Numbers of this magnitude raise many issues and questions respecting the adequacy in aggregate of the planet's resources, particularly its food-producing ones. However, global numbers by their very nature tend to obscure a good deal of important information.

More than 90 percent of the population increase to the year 2025 will take place in the developing world. The largest increase, equivalent in size to a second China, will take place in Asia, followed by Africa and Latin America. Although the largest growth in total population will take place in Asia, this will be primarily due to the fact that most of the world's people live there already - nearly 3 billion of us - rather than to a high growth rate. Asia's population is expected to increase at the world rate of 1.6 percent per year until the end of the century. Latin America's population is projected to increase by 2 percent per year. By the year 2025, Africa will have three times the population it has today.

At present there is enough food to feed all the world's peoples. But having enough food for everybody does not mean that each and everyone of us is getting enough food. FAO's Committee on World Food Security, meeting in Rome last April, had before it documents showing that per person consumption levels had declined in half of the low-income, food-deficit countries and a third of other developing countries.

Looking to the future, there are various estimates that are counter-malthusian in nature since they indicate that adequate food supplies can be produced for populations that are nearly double present-day levels. Bernard Gillan, writing in Population and Development Review, estimated that on a gross consumption basis (including amounts for food, animal feed and seed) of 9,000 kilocalories per person per day, the world could produce enough food to support a population of 7.5 billion people. This estimate is based on annual production of 7 billion tons of grain-equivalent from 1.4 billion hectares of cropland and 500 million tons of grain-equivalent from rangeland and marine sources in about equal proportions.

If the current consumption of 3,000 kilocalories per-day per person of South East Asia were to be used to estimate global food requirements, a much larger population could be supported, but it would be getting only 5 grams of animal protein per-day per-person. Furthermore, there would be too little to allow for crop failures or other disasters. The 15,000 kilocalories per-day per-person consumption levels of Argentina, France, North America and Australia could be maintained for a world population of only 4.5 billion people. If the current average world rate of consumption of 6,000 calories per-day per-person is used, world production could support about 11 billion people.

On first examination, the estimates of production possibilities in comparison with global estimates of population growth are encouraging. Together they imply that the world has the resources to feed a population more than double the size of the present one, while maintaining present-day levels of energy and protein per person. Alternatively, the world could feed an even larger population but at reduced per-person levels of energy and protein.

However, all these "encouraging numbers" are hardly cause for celebration. The United Nations' world population projections anticipate a global population of more than 6 billion people by the end of the century and more than 8 billion by the year 2025. These figures indicate that, without major technological breakthroughs, the choice of our children's or grandchildren's energy and protein levels will already be somewhat restricted. The safety net of food surplus to current requirements which underwrites large-scale crop failures will have diminished significantly. It would be wrong to dismiss such an outcome as an impossibility.

Crop failures due to short-term weather conditions and other natural hazards such as insects, are serious enough, in and of themselves, as we know most

recently from their effects on food supplies last year and this in Africa and Asia. However, an additional, and possible more serious, threat to increased and sustained food production is the continuing degradation and destruction of the world's agricultural lands. Present rates of desertification, salinization and erosion promise to reduce the land area available for rain fed agriculture in Asia, Africa and Latin America by more than half-a-billion hectares in the long term - a staggering amount by any form of reckoning. Action on the environmental front is an obvious need if the promise of increased production to meet increased population is to be realized.

However, even the prospect of food production growing faster than population conveys a falsely optimistic picture, one that is completely at odds with the results of the food security situation of individual countries, communities and families. It is easy to forget, but well to remember, that history has many examples of people, whole populations, starving in the midst of plenty, not because they did not know where food was but because they had unfortunately no legal right to enough of it. The fact that there is enough food around does not mean that there is not famine, hunger and malnutrition for the people who have no effective legal right to eat the food that is there.

Last year, Ministers of the World Food Council were pointing out that the number of hungry people in the world had been growing since the World Food Conference of 1974, and that the rate of increase had accelerated in the 1980's. Sadly, the news continues to be discouraging; not only are the numbers of the chronically hungry increasing, but millions of people are threatened every year by recurrent crop failures and famines.

This year, the effects of drought and/or civil strife again threatened the survival of large parts of the population of Angola, Chad, Ethiopia, Malawi, Mozambique, Niger, Somalia, Sudan, Tanzania, Uganda and other countries in sub-saharan Africa.

In Asia, India has suffered from the effects of what appears to be the worst drought in this century. The rains failed or were far below normal in 21 of India's 25 states; the results were crop failures. Despite these difficulties, there was no widespread threat of famine because the Indian government had set in motion massive drought relief measures and had a sizeable reserve stock of grains.

Drought damage and poor or erratic rainfall have also reduced this year's food production and have caused hardships for millions of people in Indonesia, Kampuchea, Laos, Pakistan, Sri Lanka and Fiji. Crops in the Philippines have been reduced by insufficient rains followed by typhoons. Drought or below-average rainfall are seriously affecting the food situation in El Salvador, Guatemala, Haiti, Honduras, Mexico and Nicaragua and parts of Brazil.

In much the same way that miners used canaries to indicate the presence of dangerous gas in coal mines, the health of children can be seen as the tragic indicator presaging hunger, malnutrition and debilitation in a whole population. Fourteen million children die needlessly from malnutrition and disease each year. Growing hunger has affected the health and well-being of many more of our world's children. For example, the number of children suffering from a lack of protein and energy increased from 150 million in 1975 to 160 million in 1984. Over 80 percent of these malnourished children lived in Asia, 12 percent in sub-Saharan Africa, and about 2.5 percent in the Near East, and a similar number in Latin America.

Other specific origins of malnutrition result in great suffering and often death, and ironically their prevention comes very cheaply. These include vitamin A deficiency which causes blindness, deficiencies of iodine which can result in mental and physical impairment, or iron-deficiency anaemia which reduces the well-being of women and children in particular and reduces their ability to work. These forms of malnutrition, come about not as a result of a lack of food energy but of nutritional imbalance as a consequence of specific geographical location and/or a lack of information on the need for and sources of these vital nutritional elements.

The longer-term, non-emergency need for food in low-income developing countries has been increasing for two reasons. The populations in most of these countries have been growing faster than the rate of growth of food production. Less food is being produced per person in the low-income food-importing countries of Africa, the Near East, Latin America and Oceania than there was 18 years ago.

On previous occasions of inadequate domestic production, low-income developing countries have been able to increase their food supplies through imports. On average, they had increased their imports per person by nearly 7 percent a year during the period 1970 to 1980. But, because of various reasons, including low commodity prices and heavy foreign debt, their ability to import has been reduced substantially. From 1980 to 1986, their food imports per person declined on average by 3 per cent. Taken together, reduced production and reduced imports per person have driven food consumption levels down in a number of developing countries. Consequently, there is an evident need for increasing concessional food transfers.

Despite the large food surpluses of recent years, non-emergency food aid has remained largely static at between 7-9 million tons per year during the period 1975 to 1986.

Last year, it was estimated that the number of hungry or malnourished people in the world had grown to between 500 and 700 million. Ministers of the World Food Council held this situation to be untenable and proclaimed their intention "to join together and in their united strength and interest to eliminate the scourge of hunger forever." From last year to this, because of widespread drought and other adverse conditions, the number of hungry people has increased intolerably.

When the World Food Council Ministers met at their fourteenth session this year from 23 to 26 May

in Nicosia, Cyprus, they examined the proposal made by the Secretariat. While the proposal received wide support, it was observed that food "surpluses" and hunger are separate problems. The World Food Council's primary concern is the solution of the problems of hunger. From that point of view, the Secretariat's proposal was considered to be a useful but limited contribution to the much broader efforts required to address hunger problems. The World Food Council Ministers decided, therefore, to launch the Cyprus Initiative Against Hunger in the World.

The Cyprus Initiative recognizes that past policies and programmes have been inadequate. It requires the President of the World Food Council, Eduardo Pesqueira, Minister of Agriculture and Water Resources of Mexico, to work with an informal, consultative group of member countries and international organizations to develop a course of cooperative action to combat hunger more effectively. In doing this, the consultative group is going to assess policies and instruments presently available to combat chronic hunger and malnutrition in developing countries, particularly low-income developing countries, and identify the reasons why they have not been more effective. Realistic, concrete measures to improve existing policies and instruments are going to be considered.

The group's proposals will be examined in a meeting of the World Food Council before the end of this year.

I hope that those of you gathered here today will join in supporting your country's participation in what I consider to be not only a vital endeavour, but one that holds out the hope of life - in terms of quality, not merely existence - to all mankind.

QUESTIONS AND ANSWERS

Q. How quickly can we really expect the EEC to change their support policies for farmers and how will that impact on us here in Canada?

A. I see no evidence of the EEC's Common Agricultural Policy disappearing, I see minor changes. I would observe at the same time, however, that there is substantial support for CAP from the agricultural community in the EC.

Q. The developed countries have the agricultural production potential but less developed countries do not have the funds to purchase these commodities. How do you in the World Food Council foresee overcoming this problem?

A. Well, that's a tall order, but I will try and answer it in the following way. The international community is quite willing to provide support in terms of physical food and that is what is required under emergency situations such as floods, volcanos, droughts, or war.

In my talk I mentioned that certain countries are producing less food per person than they were eighteen years ago. These countries cannot afford to import food and so food consumption per person has simply been forced down. I think there is justification for food transfer to those countries.

The only answer in the long term is for these less developed countries to increase their own food production. This means improving the infrastructure, the roads, the irrigation systems that are inadequate, the extension services, the seed production services, all the things that make farmers productive.

BIOGRAPHY

GERRY TRANT

Mr. Trant is the third Executive Director of the World Food Council. His appointment became effective May 1986. Mr. Trant was previously the Senior Assistant Deputy Minister of Agriculture Canada, a position which he held since 1977. In that capacity, he was responsible for international affairs, strategic planning, policy co-ordination and analysis, multilateral trade issues, western grain stabilization administration, price stabilization and crop insurance. He has also served as Chairman of the Canadian Agricultural Stabilization Board and the Agricultural Products Board and was the Director of the Farm Credit Corporation.

Demand for Agri-Food Products

JACQUES L. MALTAIS
President and Chief Executive Officer
Metro-Richelieu Inc.

I would like to thank the organizers of this event for inviting me to speak to you today. More precisely, I was asked to share with you my thoughts on how the demand for food products will evolve over the next hundred years. This invitation is probably due to the fact that, throughout my career, I have had the opportunity to work in areas of the food industry that had to adapt to constant changes, and perhaps because, at Metro-Richelieu, through our retailers, we keep our finger on the pulse of consumers' changing tastes and needs.

I will tell you right now that, personally, I feel completely incapable of predicting the eating habits of consumers in the year 2088. Imagine how hard it would have been for someone living at the turn of the century to imagine today's world of supermarkets, exotic foods, frozen and ready-to-eat products, when all the modern appliances and technological gadgets on the market today did not even exist back then. By the same token, it is practically impossible for us to say how future generations will eat. In a society where change is part of our daily life, the only realistic prediction we can make is that the extremely swift evolution of the food industry over the past few years will undoubtedly gain momentum under pressure from a number of different factors, such as competition, multicultural influences, developments in science and technology, and the local, national and even international economic environments. What direction will this evolution take? I would not even hazard a guess!

Although we cannot predict what and how people will be eating 100 years from now, we can quite easily imagine what the next 20 or 30 years might bring, simply by looking at current trends. And what are these trends? Even if we have an idea of what these trends are, I think that it would not hurt to review them just to make sure that we have a complete picture of what is happening.

When considering the evolution of the food industry, the first factor that comes to mind is demographics. Currently, most industrialized countries have very low population growth rates. In Canada, more specifically, even though the total population is continuing to grow slightly in absolute terms, the latest census indicates a major drop in the population growth rate, which was only 4.2 percent between 1981 and 1986. In fact, this is the lowest five-year growth rate in the past 25 years.

Besides, our population is aging rapidly. The average age of Canadians has risen from 26.3 years in 1961 to 31.6 years today. Over the same period, the number of people over age 65 has increased from 1.4 million to 2.7 million. This means that this segment of the population has been growing at more than twice the rate of the population as a whole.

Finally, although it has dropped off somewhat, immigration still accounts for close to a third of the total population growth in Canada. At the present time, nearly half of these new citizens come to Canada from Asian countries.

The overall demographic situation has a direct impact on our industry. On one hand, because of the aging of the population and the influence of immigrants, combined with the extremely powerful influence of the news media on good nutrition. These factors are forcing food producers and distributors to continually adapt their products to satisfy the changing tastes and needs of consumers. This entails considerable costs.

On the other hand, reduced growth in the number of consumers means reduced growth of overall demand and, by the same token, increased competition within the industry.

Despite the low population growth rate, higher household incomes are almost certain to bolster demand, which will likely outpace demographic growth. The fact that they have more money to spend will not necessarily make people eat more, but consumers will probably be willing and able to pay more to eat well. Since the number of women working outside the home is still on the rise, we can also expect continuing change in the distribution of the food dollar between meals eaten at home and those eaten outside the home.

Of course, the general state of the economy may dampen the effects of income growth. For instance, a new recession is always a possibility, and its effects on people's eating habits could be similar to those experienced in the early 1980's.

At first glance, then, it would seem that opportunities for growth within the food industry in Canada are relatively limited. However, we must remember that for the next 20 or 30 years, the real stakes for our industry, as for most sectors of our economy, do not necessarily lie within our borders. Our traditional market will become less and less important to producers and manufacturers because of the trend toward globalization of supply and demand, which has already started and will increase considerably in the years ahead.

Of course, adjusting supply to demand at the international level will not be easy.

While industrialized nations are currently facing food production surpluses, developing countries, with their massive population growth, generally do not have the funds to purchase the products they need.

On the other hand, given the overwhelming importance of the economy in countries like ours, governments, as we know, use various means to artificially prop up the revenue of their products out of reach for many countries.

In Canada in 1985, this industry as a whole accounted for 9.1 percent of the gross domestic product and 13.1 percent of the total number of jobs, which is a significant proportion.

All these issues are a major point of discussion at the current round of GATT negotiations in Uruguay.

What will come out of these negotiations? It is much too early to say.

However, we can already anticipate that any agreements signed will inevitably have medium and long-term effects on our entire food and farm industry. It is also likely that, with new technology, developing countries will be increasingly able to foster their own food and farm industries and, in so doing, meet a growing proportion of their own needs. We can be sure of one thing: conditions that have sustained the growth of our industry over the past 30 years will change completely in the decades to come - a prospect we should seriously start considering.

However, the market is not the only thing that will change profoundly in coming years - the very way people eat will change as well. In the past ten years, evidence of changing eating habits has already become obvious. Families are smaller, and there are more single-parent families and people living alone.

This trend is having a significant effect on the size and make-up of the weekly grocery shopping. In addition, the number of women entering the work force is still on the rise, and this has changed buying habits as well as the composition of daily menus. Meanwhile, leisure time is constantly increasing, and people have time for the now-and-then more elaborate meal.

Under the combined influence of the news media, world travel and the arrival in our country of people from different cultures, consumers are varying their eating habits and looking for more exotic foods. Finally, an increase in the general level of education and the growing concern with fitness and health have created all sorts of new requirements for food products. Increasingly, consumers are looking for high quality products and fresh products with a high energy level and low fat content.

We can also see a growing distrust of chemical products, whether used in agricultural techniques or in the manufacture of food products.

How will these various changes affect our industry? We can safely say that the stiff competition within our industry, among distributors and retailers as well as among producers, will take on many forms: container and packaging rivalry, search for site superiority and, naturally, price and marketing wars. These various forms of competition will be aimed at a single goal: meeting the new needs and requirements of consumers as well and as quickly as they appear.

The movement is already under-way. Never before have we seen so many changes in our industry as we have in the past four or five years. Food stores are changing their looks, their product mix, their marketing approach; produce departments are becoming increasingly important; butchers behind meat counters are again offering consumers highly personal service and making a big comeback; a host of specialized boutiques are being introduced: fish counters, deli counters, bakeries, bulk products, health and beauty departments. In short, we want consumers to find everything they need under one roof. Price is still important, of course; but it is not the only criterion in the choice of a store: the quality, variety and freshness of the products, and the level of service are all extremely important in the choice of a supermarket.

At Metro-Richelieu, we carry out regular surveys to keep in touch with consumers' changing expectations - expectations that do not necessarily change at the same rate and in the same way in every area. To adapt to this evolution, we have introduced numerous changes throughout our operation over the past few years.

For instance, we set up a major renovation program for our retailers so that our stores would provide consumers with not only the products and services they want, but also the atmosphere they are looking for. We have introduced a large number of specialty boutiques. And, now more than ever, we stress the freshness and variety of our products. In the meat section, we have maintained the famous quality of our products while offering consumers more refined cuts that better suit the smaller size of today's families. We have also adapted our merchandising to the changing needs of consumers. More and more often in our flyers we suggest families of products, complete with appropriate accompaniments and even full menus for special occasions. At our counters, we cater to people who do not have much time to devote to meal preparation by offering a growing selection of ready-to-eat meals.

At the same time, to compensate for the low growth rate in the food market, we have begun to diversify our operations by moving into new market segments, such as the superstore and institutional markets, and also by penetrating other non-food operating sectors which are considered to be high-growth markets; particularly the distribution of pharmaceutical products.

Changes in the grocery manufacturing sector have been as numerous as those in the distribution field. Over the past few years, we have seen a phenomenal number of new products appear, with each manufacturer trying absolutely everything in an effort to capture and hold the consumer's attention. In the United States, more than 2,500 new products arrive on the market every year, each trying to live up to consumers' new standards: "light" products, sugarless products, instant products, vacuum packaging, cereals containing 7, 8, 9 separate nutrients - the choices go on and on, following certain popular trends, such as consumer concern with health, weight, product purity, and so on. Of

all these new products, only about 10 percent survive. The ones that survive are generally the ones that meet several of the consumer's needs: for instance, products that take little preparation, are quite nutritious and have a rather elegant presentation.

Where are all these changes leading? That is a very good question. Especially since, in recent years, research into new technologies has come into play, giving us a glimpse of a future that, just yesterday, was strictly science fiction.

In terms of the presentation of various food products, it would seem that packaging will continue to experience rapid change, mainly for these reasons:

- To allow improved and longer preservation of food;
- To take up less storage space;
- To adapt to the smaller size of many households by offering smaller portions;
- And finally, to use shape and colour to attract the attention of consumers.

Vacuum and controlled-atmosphere packaging technologies will advance, along with food irradiation techniques.

The products themselves will be presented differently: meats will be offered in smaller cuts and will more often be prepared and ready to cook, or even simply to reheat, for people who do not have much time or energy for meal preparation. Complete frozen meals, intended for these same consumers, will become more numerous and more sophisticated in order to provide a more interesting alternative to eating outside the home.

Even the very content of food products will continue to change. Families with higher household incomes will substitute less expensive products for more refined ones. On the other hand, in response to consumers' concerns about their health, products will contain less salt, less fat, less sugar, fewer chemical additives and fewer preservatives. The freshness, purity and energy value of products will be the most important criteria. Furthermore, consumers will demand more information about the nutritive value of the food they buy.

At the same time, we will witness the appearance of new products on the market, which will come not from our farmers' fields, but directly from our laboratories.

We are already familiar with surimi, the fish paste that is moulded to imitate crab or scallops. It is much less expensive than the real thing, but has almost the same appearance, the same flavour and comparable nutritive value.

In Great Britain, they have already gone much further: "turkey" that doesn't contain one iota of meat is made from proteins produced by bacteria, and then formed and flavoured to resemble poultry. This product has been on the British market for several years now. Compared to real turkey, which contains animal protein, the artificial turkey has the advantage of being rich in fibre, easy to digest and cholesterol-free.

Will these types of products grow in number? Given the current state of research, it would appear so. We could even end up eating like astronauts - from tubes and packets - while staying in excellent health.

The big question is: are consumers ready to adopt all the innovations made possible by the advances in technology and biotechnology?

Personally, I think that foods made from proteins, given their low cost and the possibility of producing them from a variety of by-products, will probably be a very attractive option for developing countries, which, in coming decades, will experience a population explosion the like of which has never been seen before. Experts predict that the demand for food in these countries will have increased by 30 percent to 40 percent by the year 2025. Some countries have already begun to explore some of the new possibilities offered by biotechnology. Cuba, for example, currently produces about 100,000 tons of protein-based food from sugar cane by-products. As well, the Indies have a pilot plant that uses certain by-products which are plentiful in that area to produce a lipid-rich oil. In Canada, the recycling of cellulose residue, such as straw or the residual sludge from kraft paper production, are a source of protein-rich animal feed. The manufacture of such food could lead to the creation of new markets, which would be very interesting to explore.

However, I am not at all sure that such products would be popular in our industrialized countries. Even though people's eating habits change with time, they retain deep cultural roots. In Canada, eating well is one of life's pleasures, and people are used to eating real meat, real vegetables and real fruit. What's more, current trends are leading towards fresher products, purer products that contain a minimum of chemical additives. It is at the point now where vegetable growers who use only natural fertilizers and pesticides cannot meet the demand, in spite of the high cost of their products.

For the food and farm industry as a whole, this poses a difficult problem.

On the one hand, given the mature market in which we are evolving, Canada's food producers, manufacturers and distributors must find a way of increasing their productivity. The free-trade situation with the United States and the additional pressure that will be exerted, especially on producers and manufacturers, will oblige us to find ways of producing the same volume more cheaply.

The new possibilities offered by biotechnology could be most promising. Genetic engineering has already made it possible to produce animals that are more disease resistant and grow bigger and faster with less food, or to make certain crops more productive and resistant. Technology that facilitates the transportation and preservation of perishable goods also opens up all sorts of possibilities.

And there is practically no limit to the number of

new products that could be put on the market.

But all of these new possibilities must take into consideration the consumers' overriding concern for their health, as well as for all the factors that contribute to the general improvement of their quality of life. Ecological risks, the medium and long-term effects of chemical products used all along the food production chain - all of these factors concern today's population and are a daily feature in the news.

Tomorrow's consumers will be increasingly aware of everything to do with food and the environment. They will attribute their health and life expectancy to the quality of the food they eat, the water they drink and the air they breathe. Any innovations developed in coming years must first and foremost take these requirements into consideration.

This must apply not only to the products themselves, but also to the production methods used. Any company that endangers the environment to increase its productivity will risk massive public condemnation.

Does this mean that we must deprive ourselves of the considerable advantages offered by new technology? Certainly not. Otherwise the very survival of our industry would be in jeopardy. But this technology must be applied with great care.

In the food industry, experience has shown that we cannot force consumers to accept products that do not meet their needs and requirements. More and more, the difference between success and failure is related to one's ability to meet consumers' requirements both in one's existing markets and in the new markets that are beginning to open up.

We must use the new methods offered by science and technology to increase our productivity while keeping in mind the consumers' concern for their environment. And this in a market that is not growing very much and that will be increasingly demanding in terms of the quality, variety, purity, freshness and attractiveness of the foods we offer. This, ladies and gentlemen, is the enormous challenge we face in the years ahead.

QUESTIONS AND ANSWERS

Q. We as food producers are increasingly frustrated by the gap between farmgate prices and what the consumers are paying. It seems to me that the low commodity prices that we see, mainly in pork right now are not being passed on to the consumer. Could it be that chain stores are creating a supply management system of their own to hold the supply down artificially in order to control the price of the product?

A. No. I cannot quite agree with you that the chain stores are not passing on the prices to the consumers. If you look at the financial results of most chain operations in Ontario, we are in a type of business whereby we generate a large volume of sales with small profit margins. We are talking about less than 1 percent of sales and if you look at the marketing program of most chains you will find every week a number of lost leaders. It means that the store or the individual that owns the store has a number of products which are being sold at a loss.

Normally, in the food business, when we look at a gross margin of about 20 percent we are dong well. Salaries are about 14 percent and the other 6 percent has to cover all the other expenses. Low prices of commodities are passed on to consumers to maintain the volume of business.

Q. If I heard the Minster correctly this morning, he indicated his concern for the effect that the free-trade agreement might have on the food processing sector. As I gather, Metro-Richelieu is heavily involved in the food processing sector fare under the free-trade agreement?

A. Everybody here must have read a lot about the free-trade agreement, and I guess everyone will come up with a different answer. As far as I am concerned, we have spent a lot of time studying the implications and we are all in favour of the free-trade agreement. May the best win. That's our policy.

BIOGRAPHY

JACQUES MALTAIS

Mr. Maltais is President and Chief Executive Officer of the Quebec food retailing company Metro-Richelieu Inc. He received this appointment in 1985. Before joining Metro-Richelieu Mr. Maltais had a number of increasingly senior positions with Canada Packers. Mr. Maltais is a founding member of the Leader's Networking Group of Quebec.

Supply of Agri-Food Products

DAVID SUZUKI
Professor
University of British Columbia

I will touch on the topic of the supply of agri-food products, but that is not what I am going to spend most of my time on. I would like to discuss the challenges that I feel we all face - especially those in the agricultural community in the coming years.

I would like to begin by reminding you about the teacher's strike that was held in Toronto, a year ago, in the fall. I have two young children, who last year were in the elementary school system in Toronto. One of the first things I decided to do during the teacher's strike was to take my children to the Toronto Metro Zoo.

I did so with a great deal of enthusiasm and excitement, because the Toronto Metro Zoo is one of the great zoos in North America; but also because I well remember my first visit to a major zoo. It was after the war, when I was growing up as a child in Leamington, Ontario, in the late forties and we went to the Detroit Zoo; which at that time was considered one of the great North American zoos. If a child can have an epiphany, that was one of the great epiphany's of my life. I remember at that time being overwhelmed at the incredible abundance and variety of life on this planet. For years after I dreamed of going to the Amazon rain forest, or visiting the Serengeti plains, and it was in that memory of my childhood experience of the Detroit Zoo that I took my children to the Toronto Metro Zoo.

What an amazing difference 40 years has made. This time at the Metro Zoo at every exhibit my eight-year old daughter, Severn would ask me "Daddy, are there many of these left?" At the age of eight, she is already aware of extinction and she's worried about it. What I found was in the course of that day, I had to keep saying "Sorry sweetheart, there are not many of these left, these are endangered, these are rare."

During the course of the day I had to tell my daughters that within their lifetimes there will be no cheetahs left in the wild, there will be no Siberian tigers left in the wild, there will be no chimpanzees left in the wild. I had to tell them that on the Serengeti plains where the black rhinos once numbered in the tens of thousands, there are now fewer than in the Cincinnati Zoo.

Around the world today, life is falling before the deadliest predator ever known in the history of life on earth and that is us. You know it was not long ago that miners took canaries into the coal mines with them and when the canary fell over they got out fast because they knew something was wrong. Today, canaries are falling all around us and we simply seem incapable of recognizing it or paying any attention to it.

Failure of Futurists

I would like to first of all put to rest the notion that futurists, people who make predictions about the future, really know what the next hundred years will be like. I am not a futurist, and those who say that they are practice a craft that is no better than reading tea leaves or the entrails of birds. Most futurists like the late, great and I say great with some irony, Herman Kahn simply extrapolate along curves. Well, there is no science or art to extrapolation, you just look at a curve and simply project it. I can tell you that the Herman Kahn's of the world, futurists, fail miserably.

There are very real reasons why futurists cannot predict or project into the future. I think the most important fact is that most people fail to recognize what the most powerful factor shaping society is today. If you look at the newspapers and the news on television at night, you would very quickly conclude that the major factors that affect our lives are politics, economics, athletics and glamour. I will tell you that none of these areas is as important as the impact of science on our lives. It is science when applied by the military, industry and medicine that is by far the most powerful factor shaping society today.

When I was the age of my six-year old daughter, my mother and father never worried that I was watching too much television. You know why? There was no television anywhere on the planet. I was not allowed to go to public swimming pools in the summer because my parents were worried that I might catch polio. Youngsters today have no idea what polio is. Similarly, there has not been a case of smallpox on the entire planet for over ten years; it is extinct. When I was six years old there was no plastic, there were no birthcontrol pills, there were no organ transplants, computers, satellites, jets, or transistors. Those and much more have become a part of our daily lives since I was six years old. It is those discoveries and inventions that have changed our lives to a far greater extent than any politician, business person, or movie star. So, I think that if we accept that it is, by far, science that is the most important force changing society, then we know why futurists can never predict the future.

The nature of science is that its discoveries are unpredictable. The reason why we go into science is to discover the unknown, and you simply cannot predict where science is going to lead us. I think that scientists are guilty as much as any other group in society of promulgating a terrible myth that politicians and business people have accepted. They have promulgated the notion that science progresses

in a linear fashion. You go from A to B, to C to D, to a cure for cancer or some great new product in farming. That is not the way science works at all. Anybody who has ever practised science knows that, because science and its discoveries are simply unpredictable beforehand. Discoveries are made suddenly and applied in a totally unexpected way. The nature of science is that it is not a linear activity.

Now, if Mr. Trudeau, 20 years ago had said, "Gee, you know, I think genetics is a promising area, we better become a world leader in genetic engineering." What would he have done 20 years ago? Chances are he might have even hired a fruitfly geneticist like me, a few human geneticists, some bio-chemists. Mr. Trudeau or any other person for that matter could never have known that this would lead to genetic engineering. He could not have predicted that the zoologist studying the enzymes in a snail's stomach or that herpetologist that was studying the toxic compounds in snake venom, would make important discoveries that have made modern genetic engineering possible. Yet, indeed it was those scientists who have been the parents of monomolecular genetics. So, I use that as an illustration of the fact that science is inherently unpredictable in terms of where it leads, and that is why it is by far the most important factor shaping our lives. That is why you cannot talk about predicting the future.

There is another very profound reason why futurism simply cannot succeed, and that is because all of us are human beings. Human beings shaped by our genes and by our personal individual experiences, and it is our genetic and experiential heritage that shapes the way we look at the world around us. We look at the world through our belief and value systems that we grew up with. Those belief and value systems often blind us to the reality of what is going on. I think it blinds futurists as much as anyone else.

Scarcity and Dwindling Resources

I think today's society in the west is preoccupied with a vision shaped by a ludicrous notion of economics and progress. I would like to quote a very eminent University of Harvard economist, Professor Simon, who in his book has stated why he disparages environmentalists for stressing the idea of scarcity and dwindling resources. He writes in his book, "There is no reason why human resourcefulness and enterprises cannot forever continue to respond to impending shortages and existing problems with new expedience, that after an adjustment period leave us better off than before the problem arose." Now it is that kind of grotesque optimism and blindness that we have to overcome in order to confront the reality of what faces us in the coming hundred years.

I believe that agriculture faces cataclysmic upheavals in the coming years and they will resolve directly from atmospheric and environmental degradation. These changes and their impact cannot be predicted beforehand because of the enormous degree of our ignorance about science. We simply do not know enough about the physical and biological world around us to predict the consequences of such a thing as the greenhouse effect, for example. The grand claims of biotechnology that they are going to somehow lead to a new wave in the revolution of agricultural technology are denied by the reality of what history tells us.

No one denies, and certainly I as a geneticist would not deny, that biotechnology is a very powerful area that invokes manipulative powers of molecular genetics in undreamed of ways. In the context of massive global pollution and climatic changes we simply cannot expect genetic engineering to be our salvation, any more than the past use of pesticides has been in agriculture. I would like to spend the rest of the time discussing the future by looking at the only tangible data that we have and that is the past.

Human beings have existed, biologists tell us, for perhaps 600,000 to 800,000 years. For 99 percent of that time, human beings have existed essentially in the state of nature as hunter-gatherers. Our numbers for 99 percent of human history were small, our technology simple, and our impact on the environment was slight. For most of our existence here, nature essentially was endless, was vast, and endlessly self-renewing. What has happened?

I have actually spent some time with hunter-gatherers in the Kalahari desert in Africa and I recently returned from five weeks in the Amazon rain forest where I spent time with the Kyapou indians. Hunting and gathering is not such a bad existence, unless you feel that your compact discs and your Sony Walkman's are important.

The invention of agriculture, however, 10,000 to 12,000 years ago, signalled a profound shift away from nomadic hunting and gathering to permanent settlements that became the precursors of our great cities. It was agriculture more than anything else that enabled the incredible blossoming of civilizations around the world. But even after the invention of agriculture, for most of the millennia that followed, life was still simple and completely dependent on the vagaries of nature.

With lightening speed over the past two centuries all of that has changed. It took all of human history, 600,000 to 800,000 years for our species to achieve 1 billion people on this planet in 1830. Then in only 150 years we went from 1 billion people to 5 billion and in another 40 to 50 years our numbers will go up anywhere from 8 to 10 billion. Now, that is a staggering increase in numbers. In terms of the planetary biosphere, this has been catastrophic because we are like no other species that has ever existed on earth.

Today, we are the most abundant, numerous, large mammal on the planet. There is no other species of large mammals as numerous as we are. But we are not like any other large mammal. We are armed

with the incredible muscle power of science and technology and it has given us an ability to attack the environment in a way that no other creature has ever possessed. We invented machines and we discovered an incredible source of energy that was plentiful, powerful and portable. That was oil and gas. So with the explosive increase in numbers and the invention of very powerful machines, we have now had an unprecedented impact on the world around us.

I have spent a great deal of time in the Queen Charlotte Islands over the last five to six years. A hundred years ago Hydai indians took months to cut down a single cedar tree. Today, one man and a chainsaw can cut down the same tree in a matter of minutes. You see, there has been an enormous escalation in our ability to attack the environment around us. You all know the impact of the machinery in terms of the prairie provinces in Canada. We have been able to totally change the incredible wetland ecology of the prairies by our ability to drain, to fill, to dig ditches, and to put enormous acreages under the plough. Today, all of the estimated 30 million species of plants and animals on earth are now completely held at ransom to human beings, to human might.

I mentioned that I have spent a great deal of time with the Hydai Indians in the last few years. Native people in British Columbia have taught me a very valuable lesson. They have taught me to listen to my elders. Because of that I have spent a great deal of time in the last two or three years talking to older people in Canada and I have talked to loggers and fishermen in B.C.. What they describe of my province 50 years ago is something that we simply do not know today. I talked to prairie people about the great migrations of waterfowl in the wetlands of the prairies. The birds literally covered the skies for days on end, there has not been anything like that in decades. If you talk to people about the quality of water in Lake Ontario 50 years ago, you know that you could dip your cup in the water and drink. Today, you walk down to the shores of Lake Ontario in Toronto and there are signs saying if you are pregnant do not eat any of the fish that come out of here. Talk to old Maritimers, they will tell you about Cod and Lobster of the size and number that young fishermen in the Maritimes have not seen for over ten years. What our elders tell us is that they are a living record of the enormous changes that have happened in our country in the span of a single life. They warn us then of massive problems that are afflicting the entire planet.

Scientists at Harvard University estimate now, that up to 17,000 species of plants and animals are going extinct every year. That is one every 30 minutes, and that the rate of extinction is accelerating. Habitat destruction, human over-population, massive global pollution, atmospheric degradation, desertification, deforestation; these are global issues that are affecting the quality of our lives and will affect us into the future. These are issues that our children will have to contend with. Yet look at what has happened in the current election. Have you heard anyone seriously discussing the nature of these global environmental issues and what can be done about it? None of the parties, none of the major political figures are dealing in a serious way with the reality of these issues.

Agriculture and the Environment

We today are changing the nature of the very support system within which farmers must operate. Acid rain is changing the make-up, the chemical and the species composition of soil. It is leaching out nutrients and changing the micropyle ecology on which many of our crops depend. The greenhouse effect is real. It is undeniable and it will continue, whatever we do now. It is going to continue into the next few decades and you will see an increase in temperature that will be nothing short of catastrophic. If you think of someone who lives in Prince Edward Island the effects of a three to four foot rise in the ocean would be disastrous. Those who find it exciting to think about vast areas of Canada now being opened up with a longer growing season, I think are really looking at it in a very short-sighted way. Entire ecosystems are going to have to make way or adapt to the increase in temperature. It is ludicrous to think that we are going to rush in and exploit whole new areas for crop production. We do not know what is going to happen; but we do know the temperature effect will be serious and that the ramifications for farmers in the prairies especially, will be nothing short of cataclysmic.

Desertification is one of the major crises affecting countries around the world. The loss of topsoil in Canada is a major problem that governments have not begun to address. I think the most destructive practice by farmers today has been the use of chemicals. We have completely forgotten some very important ecological principles in our use of chemicals. I am talking about antibiotics as well as the massive use of fertilizers, pesticides, and herbicides.

I would like to remind you of what some of those simple ecological realities are. First of all, we are animals, and as animals like all other animals, we require clean air, clean water and clean food for our proper health and viability. We ought not to forget that. As animals we ought to be aware that every single thing that we need for our nutrition was itself once living. The environment is not infinite. It is not infinitely absorbing of our debris and it is not infinitely self-cleansing. We have overloaded the environment with our industrial waste, which includes man-made chemicals that have never existed before and do not biodegrade. However vast the dumping grounds are whether it is water, air or soil, it is still finite and those chemicals will accumulate and whatever accumulates in the ecosystem ultimately cycles back through our water, food and air into us.

One of the most incredible oversights on our part is that we have totally forgotten that 99 percent of all animal species on the planet are insects. They are

the most numerous and the most important group of animals on the planet. They are absolutely vital to whole the ecosystem. Animals and plants depend on them whether it is for pollination or for food, or for the control of other pest species. Less than 0.1 percent of all insects are pests to human beings. The notion that we use chemical pesticides to control and manage our agricultural pests is one of the most short-sighted notions I have ever heard of. It would be comparable to say we are going to manage crime in New York City by killing all the people in the city. You would get rid of crime, but that is not management. The same I feel applies to herbicides. The notion that we can continue to spew out what are essentially plant biocides in order to maintain a limited number of crops is very short-sighted.

One of the most important discoveries made in genetics since Watson and Crick's formulation of the DNA molecule has been the discovery that if you look at a species, however confined it is, there is an incredible amount of genetic polymorphism. Genetic variability is built into any species you want to look at. This was one of the great surprises that geneticists encountered because they looked at uniform species of fruit flies or inbred plants and they thought they were going to find they were genetically homogeneous.

Genetic polymorphism is a part of every species biological repertoire. People like Paul Ehrlich from Stanford University are saying that species polymorphism is every bit as important as saving a set number of species. In other words, we have retained the buffalo; but what those buffalo are is really a very pale shadow of what buffalo really were in nature because they have a very limited genetic base. The whooping crane essentially is an artifact. They were reduced to 15 animals and from that genetic base we have resurrected them to what, 150 animals. Those are not whooping cranes as biologists think of the species. They are an artifact. We must understand that species variability, genetic polymorphism is as important as retaining the species itself.

The tendency of modern agriculture is in exactly the opposite direction. We tend to plant vast acreages in monoculture, we reduce the biological diversity and we depend on very specific ingrown or inbred strains of plants and animals. I have just come back from five weeks in the Amazon and I see this grotesque practice of agriculture in Brazil. The Amazon rain forest, which is the richest ecosystem on the planet, has been destroyed and replaced by essentially one species of mammal - cattle. It is a mockery to think that is good sound management of that resource and that it is a wise thing for Brazilian farmers to do.

I believe that the future of agriculture then, lies not with this continued trend towards vast acreages and of single crops and reliance on biotechnology to generate high producing strains. You cannot expect genetic engineering to double or triple productivity in the coming years. I have heard people in Canada, who are in agriculture faculties, say that the solution to the world's population problem resides in using genetic engineering to increase food productivity. Even if we could increase the production of food through genetic engineering, it is ludicrous to think that we can continue to escalate food production by biotechnology when you have a population that is in runaway exponential growth. The solution is not biotechnology, but to bring those populations under control and to improve the political and economic systems of food distribution.

I believe that the real future of agriculture lies in exploiting the incredible biodiversity that exists on the planet today. The potential for natural weed and pest resistance for tolerant species to dryland, to temperature extremes, to salt, to higher levels of nutrition and productivity will come not through greater biotechnological innovation but from the identification and exploitation of naturally occurring genetic variability in wild populations.

Today we use a tiny fraction of the potential that exists in the diverse species on the planet. Dr. E.O. Wilson, a professor of Zoology at Harvard University, says that perhaps 7,000 plants have ever come under cultivation for use as food. But he estimates that there are at least 75,000 thousand edible plants in the world today and that many of them are superior to the ones that we use in agriculture. Only about 150 plants have ever been grown commercially. Today, most people live on about 20 major crop species, and the three major ones are grass species, rice, corn and wheat. When you think of the enormous potential that exists on the planet and how small the base of agriculture is today; the real opportunity resides in looking into the biodiversity, and not using genetic engineering for that tiny base of crop species that we use today.

False Values and Beliefs

Today we operate under a number of assumptions that are taken for granted as truths, but in fact they simply do not hold up if you look at them. If you are looking at the next hundred years for agriculture, what you have to do is to look at the belief and value systems that underlie whatever we are doing. I will now examine some of these values and beliefs that do not hold up under close scrutiny.

The vast majority of Canadians live with the delusion that we somehow lie outside of nature. The belief that we are not like any other plant or animal species, that we are above nature and in control and manage the world around us. The reason we live with this illusion is that 80 percent of Canadians live in urban settings and those of us who do live in rural settings, live in an area that is created in our image.

The Bruntland commission suggests that today's generation of children is at the greatest risk of getting cancer of any generation in human history and that every subsequent generation will be at even greater risk. I believe the reason for this is that we have forgotten that we are still animals who are as dependent on the ecosystem as any other animals.

We believe that we control nature through science. I hear this repeated over and over again by politicians and my fellow scientists. Now I have said that science is the most potent factor affecting our lives. That is true. But anyone who says that science gives us the power to dominate and control the world does not understand the nature of science itself. Science in fact cannot provide us with the kind of knowledge that we need to manage the rest of nature.

Throughout the history of human kind it becomes very clear that humans always have wanted explanations as to how the world operates. The Nobel laureate, Francois Je Coub in France, has said the human brain has a built in need for order. We have a need to explain everything and put things in their place. Anthropologists say that we demand to have a world view. In a world view everything makes sense, and from our earliest records people have constructed world views. Now that world view embodies a great deal of accumulated folk knowledge, superstition, ignorance, and religion; it embodies what we believe about the world around us. Traditionally, world views have a huge fudge factor, they are called gods and goddesses. If a storm breaks out, or you have an epidemic, we say the gods must be angry at us. Even though we really do not understand the cause, we have some kind of explanation. Every society has to have a world view.

Science came along in the sixteenth century and Francis Bacon saw that science was a very powerful way of learning, but he did not have any intention of providing a world view. He said, with science we may be able to understand how God works. Science differs from other ways of knowing by focusing on a part of nature, isolating that part, bringing it into the laboratories, controlling everything impinging on it, and measuring everything coming out of it. We learn scientifically by isolating a fragment of nature. We gain tremendous comprehension of that one part of nature. Now that is the very essence of this scientific method.

What has confused us are the ideas of one of the great giants of science, Isaac Newton the discoverer of gravity. Newton said, it looks like the whole universe is like a giant clock, and through science we can dissect the parts of the clock. Look at the springs and the cogs and the wheels and by understanding the basic elements of the clock we will be able to put it all back together and flesh out the entire universe. It was Newton who began what is called "the reductionist revolution".

Physicists have learned that Newton was wrong. When you try to zero in on an atom to see what it is, the fuzzier it gets. You cannot see the neutrons and protons in there because they are constantly moving. You cannot zero in on an electron because the closer you get, the cloudier it gets. The quantum mechanics tell us the atom is built up of shells in which the electrons orbit and the clouds are statistical probabilities. An electron will be at any given point at any given moment. Well, if you cannot tell where every atom, electron and proton is going to be, how are you going to put it all back together and predict the entire universe? Physicists also learned of a very important phenomenon. You can study a hydrogen atom and you can study an oxygen atom and learn everything you want to know. But then if you ask: What are the properties of a substance made by combining two hydrogen atoms and one atom of oxygen? A physicist will say I do not know, and the reason is the properties of the isolated parts do not help you predict what will happen when you put them together. That is simply a phenomenon of synergism. They interact in a way that makes the whole greater than the sum of the parts.

Most biologists and most people in agriculture still cling to the reductionist theory. Look at nature in isolated bits and pieces and you will be able to reconstruct the whole system. This is simply not on. Now, the reason why biologists don't like that is interesting. There was for years this idea of vitalism, that life differs from non-life in having some vital force. For centuries biologists were weighing and measuring plants and animals and then they would kill them and weigh them and measure them to see how big the vital force is, how much it weighs, and what its properties are. That is metaphysical nonsense. But the minute you tell the biologist that the whole is greater than the sum of its parts he immediately says your a vitalist. It is a denial of what physicists have already learned.

Science by focusing on parts of nature cannot predict the consequences of what they learned in terms of larger component systems. So, however carefully we study plants or animals in growth chambers in isolated plots you simply cannot predict the consequences when you start applying that in a much larger ecosystem.

I would like to begin first with DDT. When DDT was found to kill insects, the benefits were immediate and obvious. The chemical industry would make a lot of money, and they did. Now, then you say, what are the possible costs? Any ecologist would have said it does not make sense to kill 99.9 percent of insect species just to kill 0.1 percent that are doing the damage. Any geneticist could have said it does not make sense to apply this very powerful chemical pesticide when you know that you are going to select for resistant mutants and very quickly you have to go to other different kinds of pesticides in order to stay on top of it. You could have predicted before hand that chemical pesticides did not make biological sense.

But no-one could have predicted a phenomenon called biomagnification. When you spray at very low concentrations of one part for 10 million or a billion, that those chemicals would accumulate in the ecosystem, be consumed by micro-organisms that are eaten on up the food chain until, in the mammary glands of women, or in the shell glands of birds, you would have biomagnified that compound hundreds of thousands or even millions of times their original concentration. Why couldn't we have predicted that beforehand? Because we only discovered biomagnification when Peregrine falcons and eagles

began to go extinct.

Scientists did not know that there was a thing called biomagnification until long after we began to use the technology. The same is true for antibiotics. If you did a costbenefit analysis, the benefits to the pharmaceutical industry were immediate and obvious but we could not have predicted the thing called multiple resistance factor. Why? It was only after the extensive application of antibiotics that we discovered the phenomenon of multiple resistance that resides in plassmens of bacteria and that these multiple resistance factors can be passed very readily across a generation of micro-organisms. What I am saying then is that we are faced with a terrible conundrum, that we can recognize the immediate benefits of new technologies, but we simply cannot anticipate the costs, because our ignorance of biology is so great. We face this terrible dilemma. Can we continue to opt for short term benefits in the knowledge that we do not know what the costs will be, and in the faith that we will invent a new technology to solve the problem that the old technology has created? I don't think we can.

Limits to Growth not Progress

We have come to accept that in order for our society to progress we need to have growth. I remember being stranded in Heathrow Airport, there was a bomb scare. I found myself standing next to one of the great liberal members of parliament from years ago. I started to talk to him about my ideas and I said, you know we cannot have continued economic growth indefinitely, it doesn't make any sense, nothing in the world grows exponentially the way that we seem to demand economically. At the end of it he said, well listen, I can understand everything you say but your saying that we cannot continue to have progress. I was really struck by the fact that he had equated progress with growth. It is true in our society today, progress and economic growth have become interchangeable. We believe that we must have economic growth to have continued progress. Now this is something that makes absolutely no sense to me as a scientist.

The problem with growth and the need to have growth for progress is that there is no end to it. Today, ladies and gentlemen 20 percent of the world's population, that is us, the United States, Japan and Europe, is using over 80 of the world's resources. We are the major consumers of everything on this planet. We are the countries that are demanding to have our three, four or five percent economic growth a year.

Let me tell you that nothing in the universe continues to grow exponentially indefinitely. If you insist on your one, two, three, four percent growth that means that the amount, whatever is growing, will double in a given length of time. If you have one percent growth, whatever is growing will double in 70 years, if you have two percent growth, whatever is growing will double in 35 years, if you have three percent growth it will double in 22 years, four percent growth will double in 17.5 years.

Let me show you why it is ludicrous to cling to the idea that we must have growth. I will give you an analogy using a test tube with food for bacteria and I am going to introduce into this test tube one bacterial cell that is going to grow exponentially. It is going to divide every minute. So, at times zero, you have got one cell, at one minute you have got two, at two minutes you have got four, at three minutes you have got eight, and so on. That is exponential growth. At 60 minutes, the test tube is completely full of bacteria and devoid of food. The question is at what point does the test tube become half full or half empty? The answer is 59 minutes. At 59 minutes you are one minute away from filling the test tube. At 58 minutes, you are 25 percent full, at 55 minutes the test tube is 3 percent full or it is 97 percent empty. Now if at 55 minutes one of the bacteria looked around and said, "Hey guys, I think we have got a population problem. We are going to run out of space". The other bacteria would say, "You are nuts! 97 percent of this place is empty". And they would be five minutes away from being full.

Now let us suppose the bacteria are no different from people. At 59 minutes they finally say, "I think we have a problem". So they put money into their biotechnology group and all their hot shot high technology and science and they find a solution. So the bacterial scientists jump out of the test tube and run all over the universe and they discover three test tubes completely full of food with nobody in it. They run back and say, "We have just quadrupled the amount of food and space". How long would it last with exponential growth? Well, at 60 minutes the first test tube fills, at 61 minutes the second test tube fills and at 62 minutes all four are full. Quadrupling the amount of food and space simply buys you two more minutes. There are many people, including myself, who believe we are long past 55 minutes. No amount of new technology is going to buy us a quadrupling in the new amount of whatever we need. The nature of our technological impact is, once a species goes extinct, no amount of science or technology will ever bring it back.

You changed the world irreversibly when you cause species extinction. E.O. Wilson estimates over seventeen thousand species are going extinct every year. We cannot cling to the notion that we can continue to have steady exponential growth.

I would suggest to you that we have to aim no longer at zero growth. We have to aim at negative growth. I do not agree with Bruntland you see, who feels that we can have development and be environmentally responsible. I do not think it can happen. There is a direct inverse relationship between the quality of the environment and the amount of economic growth. We have to begin to talk about cutting back. Anyone that tells me we need more in order to maintain the quality of life does not remember what life was like when they were children. I grew up in the forties, we used much less of everything in the forties. We lived rich, full lives.

If we are genuinely concerned with the future of agriculture, then we have to give up the belief that biotechnology and will allow us to continue to expand production. We have to see that the future of agriculture is intimately tied up with what happens in the global environment. What happens in the oceans, in the great lakes, in Brazil, in the atmosphere is extremely relevant to farming today in Canada.

Species extinction, next to nuclear war is the greatest threat that we face on this planet today. You all ought to be seriously thinking about what the consequences are. I think the challenge for us is to restore some kind of sense of belonging, of connection that will lead to a very different way of approaching our new technologies or applying our new technologies.

Need for Reassessment

I would suggest that there is a profound way of beginning a reassessment of our connection with the environment and I think that it comes through those people who have been farmers for several generations in Canada. Let me explain what I mean.

You look at farmers in Canada today and say why do they bother? Why do they bother struggling to keep that piece of land? It is not because of the money they are going to make, it is because that land is their history. What matters to those people is a sense of continuity that has no value at all in the market place. I would suggest that it is that spiritual sense of connection to the land that native people have, that farmers have, that is really important to begin that understanding of how we are connected to the land. There is something very profound that comes out of the agricultural experience, that could reconnect us in a very deep way with the ecosystem of which we are a part.

I would like to close by just challenging you again, to see that underlying all of our assumptions today is an invention of the human brain that is a total perversion. That perversion is economics. Global economics today is simply a loony tunes construction that makes no ecological sense. Economics only puts value on things that have value or meaning to human beings.

When economists tell us that the ocean floor is undeveloped, and has a lot of potential. In fact, the ocean floor has been occupied by hundreds of millions of organisms for millions of years. It is fully inhabited and fully developed. It is only economists that say, it is undeveloped. The same applies to the Arctic or it applies to the vast wilderness in the rain forest.

Economics is a system that enslaves the third world. I have just come back from Brazil, which has the highest debt of any third world country in the world. There they are converting their food crops to cash crops. They are destroying the rain forest to get the money to service the interest on their debt and when they have destroyed the rain forest they will still be as much in debt as they ever were. We, globally would have lost the richest ecosystem on the planet.

Economics is loony tunes because I hear certain economists say that without free trade with the U.S. we are an imminent economic basket case. I say to you, what does that mean? Kenneth Boulding, who is one of the great economists, from the United States, once suggested to me a very simply thought exercise to determine how wealthy a country really is. He said, imagine the Canadians wake up tomorrow and discover that the entire planet has disappeared except for Canada and 200 miles of ocean. Would we starve? How could we starve, we are one of the few bread baskets in the world. Would we freeze? We have reserves of oil and gas that are beyond the dreams of most countries in the world. Would we lack for raw materials, for our clothing, for our homes? Of course not. We, by any criterion you want to use, are one of the most gifted countries in the world. We have an educated population that is capable of creating anything we need. Yet, global economics says, that we are an imminent economic basket case.

What do many economists tell us is such a great model that we ought to emulate. Well, of course, it is Japan. Well, let us try the Boulding thought exercise. Suppose the Japanese wake up tomorrow and discover that the world has just disappeared except for Japan and 200 miles of ocean. They would be in deep trouble. They have so polluted the air, water and soil of that country, they cannot support that country with food. They have virtually no raw resources, raw materials, except forest. They have virtually no energy, except very low grade geothermal energy. Overnight, Japan would be transformed into a very poor agrarian economy and yet, global economics say, Japan is this great model for all of us and that Canada is an imminent economic basket case. I would suggest that we ought to look very closely at what this economic system is because it is tearing at the very fibre, at the very roots of this very thin skin of life on the surface of this planet.

The challenge then is to come to some modern connection with the land in a profound way, to develop an ecological perspective that makes sense in our political and economic institutions and to discuss the limits to what the depredations of our society is doing on the planet today.

QUESTIONS AND ANSWERS

I should tell you, my aim has been to stimulate discussion, so I have tried to be as provocative as I can because now is the most interesting part which is your chance to ask questions. So please let us have a discussion.

Q. I feel scientists and farmers are very close cousins and you have expressed a concern about the environment. You have challenged the farmers to do their part in saving it. Since science is more important than economics, sport, politics and

glamour, we as farmers need help and we challenge you as scientists to help us.

A. I agree completely. I personally think that we have got to get off the high-tech chemical kick that we are on. If you look at Agriculture Canada, for example, they are turning down grant applications in the area of organic farming or alternatives to the high-tech approach. If you look at your own profession I have only recently encountered the fact, that there are some farms that are attempting to grow beef without any chemicals at all and the beef farmers are now raising objections to this by saying that to offer on the market, beef that is chemical free suggests that regular beef is of a lower grade. They are attempting to keep the chemical free beef off the market or at least have it marketed in a different way. I suggest that is just not tolerable.

Q. The federal and provincial governments are setting up round tables on the environment and economy and I just wondered what your view is. I did note that in Ontario the first list that came out did not have one person on it that represented agriculture, and I feel that they have a big part to play in it. What would you see as their mandate?

A. Well, I agree with you. I think that the problem is the environment. What we are seeing is politicians paying lip service to the environment. It is not that I am demeaning or denigrating politics, but I think they of necessity must look at their activity within the limits of a four or possibly five year time span. A lot of groups, loggers, farmers, people in cities, native people, have been writing to me saying we have got to do something serious. We are talking now of setting up a foundation which will look into the institutional changes that are required to have an ecological perspective and to develop actual strategies for getting these into place. I think that is what is needed. The way governments' attack the problem, they disappear within the fragmentation of the political structure.

Q. What are your feelings on breeders rights in Canada, is this our chance to say no to competing with the rest of the world and hold our own?

A. Well, I personally think, that if we are going to talk about humanitarian interests and global populations, the notion of patenting and profiting by retaining rights to germ plasma is not the way to go. I think it is short-sited because the really important germ plasmas that will fuel the agriculture of the next century, will come from the very third world countries that are being affected by the current patents. I think it is the enormous diversity in germ plasma that exists in tropical rain forests for example, that is going to be the heart of the agricultural revolution of the twentieth, twenty-first century.

Q. David, I watch your shows, "The Nature of Things" and special series and I always find myself being depressed when it is over. You raise all these important issues and yet, none of us seem to listen. I have got two questions. Have you ever considered politics yourself or perhaps inspiring some of your colleagues to, perhaps, go down this route? My second question is, are we going to have to have a disaster to wake up?

A. Well, okay let me deal with the last question first. A lot of people write to me and give me hell because they say I am too relentlessly depressing. Now I happen to feel that I am very, very optimistic. I believe that the way we are going right now, is towards a real disaster. But the reason I continue to write and continue to do television is that I really have faith that people can be swayed by reason that they can change deliberately if informed to a sufficient degree. Now to me that is optimistic.

What gives me real hope is that human throughout history people have operated on the assumption that we love our children. We want our children to have a better life than we did. That has always been what parents have hoped for. Now for the first time in human history we know that is simply not true. Our children are inheriting a much poorer planet than we had and I would think that anybody who believes and really means it when they say they love their children cannot continue then to operate the way we have. If children cannot be the ones to make us change, then I think as a species, we deserve to go the way we are going now.

What worries me, is that we have very powerful denial mechanisms. As I said, there are canaries falling all around us. When you hear about the seals that are dying in the North Sea, what is happening to them is not unconnected to us. When 400 Beluga whales die in the Gulf of St. Lawrence and are so toxic that you have to do an autopsy with a mask and gloves, that has to be telling you something. When enough of our children start dying and it is undeniable that what they are getting in the air and water is what is doing it, then we will finally wake up. That is going to be very late. I do not want it to reach that point. So that is why I feel my optimism is based on the fact that we love our children, and parents have got to pay attention to what our children will inherit.

In terms of strategy, I am a rabid fan of democracy. I think that it is the greatest system ever invented. It is far from perfect, there are real problems. I believe that we get what we deserve and to the extent that our politicians please us, we ought to take full credit for that. To the extent that they disappoint us, we ought to take full credit for that. So I say, that fundamentally I think, change has got to come through the democratic system and the reason why politicians are even saying anything about the environment is because of the immense pressure that has been brought to bear.

Having said that, I personally will never run for office just because I think it takes very special kinds of people to run for office and I know that I could not stand it. I think politicians are amazing people, the abuse they take is unbelievable.

Q. When David Suzuki weighs his optimism, and his pessimism, and his capacity of denial, and you look at your daughters and if they give you the opportunity to influence them in their lives when they grow older are you going to encourage them to have children?

A. I don't think that it is up to me to determine whether they are going to have children. That is their decision. I can tell you I have a daughter who's been married for five years and she and her husband have deliberately decided not to have children, I can't say anything about that. But when we as a species simply say that there is no hope not just for our species but for much of the ecosystem that is, I think, a very tragic day and I will do everything I can to fight off the day when that is undeniable.

J. Lifton, a psychologist from the United States, has talked a great deal about nuclear war and what this has done psychologically to us. What is horrifying about nuclear war, which is kind of a metaphor for technology is that not only can we conceive of the end of human existence we can conceive of the end of life itself with our technologies.

Now if you asked me, deep in the bowels of my favourite pub, what are the chances that we are going to make it, I would say, that the chances are pretty grim but I have not given up. I think you can't give up because it is trying that matters. It is the struggle that defines us.

BIOGRAPHY

DAVID SUZUKI

Dr. Suzuki, scientist and journalist, has been Professor of Zoology at the University of British Columbia since 1969. Over the last twenty years Dr. Suzuki has popularized science through books, newspaper articles, radio programs, and TV shows. Between 1974 and 1979 he was the originator and host of the weekly one-hour CBC Radio Show "Quirks and Quarks." Currently Dr. Suzuki is host of the CBC TV show, "The Nature of Things."

Continued Evolution of the Food Regulatory Environment

J.B. MORRISSEY
Assistant Deputy Minister
Agriculture Canada

I would like to take a few seconds to run through the functions that we do in the part of Agriculture Canada that I work with on a day-to-day basis. I would also like to look at the changes that have taken place in the recent past which may provide us with an indication of how the future will evolve.

The activities that Agriculture Canada is involved in are health of animals, plant health and food inspection, as well as food safety and food quality. The kind of work that we do on a day-to-day basis for example, is attempting to keep exotic animal diseases out of this country. Toward this end, we have a quarantine station in Edmonton. The second piece of work is ensuring that those diseases, which do get into Canada, are either eliminated or controlled. We are speaking primarily here of diseases of economic importance or human health importance, transmissible to humans, and primarily those diseases which are not possible for any one owner to eliminate but the control provides a benefit to the nation as a whole.

Similarly we are in the business of keeping plant diseases and plant pests out of Canada. We inspect food for safety, and quality. We grade hogs for economically significant factors. We also negotiate the export requirements for animal health, to allow our livestock to be shipped around the world and negotiate the export requirements for phytosanitary certificates. Lastly, we do laboratory work which allows us to deliver these particular programs.

There are several changes that have taken place over the last few years, which have influenced our past work. I think these changes will be a precursor for what is going to happen in the future. To begin with, the Neilson Task Force made some recommendations which had a fairly important impact on us. The first was that we dissolve the grading activity or the quality assurance activity to industry - either through industry doing the work themselves or through us doing the work, but having industry pay for it. Contracts have been negotiated, for example, in the grading of carcass poultry, and that work is actually done by the industry and a spotcheck is done by our staff. On the other hand, in the case of grading of pork carcasses, the work is done by Agriculture Canada staff and a payment is made by the industry.

Another set of recommendations made by the Neilson task force affected the way all of the federal agencies, and perhaps later the provincial agencies, do business in food inspection. Neilson suggested that the food inspection program in Canada was being delivered on a satisfactory basis; however, he recognized that constitutionally there is a division of power between the federal and provincial levels of government. He also recognized that no one federal department was a continent unto itself. That there was interdependency amongst at least four federal departments: Agriculture, Health and Welfare, Fisheries and Oceans, and Consumer and Corporate Affairs. The suggestion made by the Neilson group was that uniformity of federal regulations be established. In other words, agencies such as Agriculture and Fisheries reference the health and safety provisions in the Food and Drug Act so that over time you would have one set of standards amongst all the federal departments.

The next suggestion was that once the federal house has been made uniform, we go out to our colleagues in the provincial governments and see if we couldn't negotiate uniform basic food safety standards all across the country. That is the next step and it will be undertaken in the near future.

Another recommendation was to deal with the perceived irritation experienced by food processing plants where an Agriculture inspector could come in today, the Health and Welfare inspector tomorrow, and another agency on the third day. It was intended to have one agency look after the interests of the sister agencies so that the plants would only have one agency to deal with. This in fact has been done and agreements have been signed to this effect.

Lastly, since for example, Agriculture will be the contact agency in plants registered by Agriculture, and Fisheries, the contact agency in plants registered by Fisheries, there would be an exchange of information between the federal departments so that, the work which we do for Consumer and Corporate Affairs and Health and Welfare in the plants is in fact done to the specifications established by those agencies and they get information back.

Cost Recovery

Cost recovery primarily in the area of grading, is another change where we actually do the work. Contracts have, again, been signed with the parties of interest for five years, between 1986 and 1991. The costs have been phased in over a five-year period to allow us and the industry time to adapt.

Cost recovery had the obvious effect of transferring costs, but it had a more subtle and perhaps more significant effect. This was the recognition of the fact that we really are not that different from most commercial businesses. We are a service agency providing a service. We supply a service and we have historically supplied it at a low cost, which

meant we had a high demand and in a time of restraint we had difficulty meeting that demand. What happened when we raised our costs was the demand declined; particularly for voluntary programs. Industry came back and said, we do not need this service or substitution, we would like to substitute a different way of doing this business. For example: can we jointly find a way that is more cost effective, saves us some money and saves the client industry some money? This was a significant change. It meant we now had a joint, vested interest in finding the least costly way of doing business.

I would like to make a comment on the business statement or the objective that we have set for ourselves. We took the word, *marketability*, to mean "protection of the marketability of agricultural food and forest products," from a study done by Ruth Allen in the United States for the USDA. The word *marketability* in this context doesn't apply to marketing product - that is the role of the private sector. Marketability really means doing the structure-type work that gives access to a market. For example, if we had foot-and-mouth disease in this country, we would not be able to export livestock or fresh meat to a great number of countries, at any price. It would simply not be marketable. Our role is to ensure the marketability of that product. Another example would be seed potatoes into the European common market. We cannot ship seed potatoes to the European common market, at any price. They are not marketable unless we have a controlled program for bacterial ring rot disease of potatoes, which is done to the satisfaction of the EEC. Our last example, in forest products, would be the shipment of logs to the EEC. The EEC is concerned about the pine wood nematode, the pest of lumber. The risk can be reduced by debarking the lumber before it is shipped. Again, we provide that certification as an objective third party and we open a market. We create marketability.

Organization

What would the organization structure look like to deliver those programs? We said to ourselves, over time we should continue to evolve the structure of the organization so that the form of the organization reflects the functions that the country asks us to perform. So if you are in the business of animal health, plant health and food safety and quality inspection, then that is the kind of structure that the organization will evolve into over time. The world seems to be changing so quickly that we don't feel we have the luxury any more to make a quantum change every five or six years. Whether it is in the way we do our work or whether it is in organizational design, we find that as an opportunity comes up we are having to make small adjustments. The movement of the organization to that structure will probably take place as people retire or as people get promotions. Again, as resources became tight for the last few years we found that we were really not a business agency. We don't have a bottom line which tells us where we are successful and where we are not. We tried to introduce a proxy. We concentrated first of all on effectiveness, since as resources became tight, we had to change the way we did business. We had to try to find another way to deliver the programs, which was more cost effective. While we were making these changes, we wanted to keep our eye on the quality of the final product, the service we were delivering, so we needed a way to measure that effectiveness as we changed the system.

The system we came up with is a rating system which gives excellent performance an AAA rating and a fail category an F rating. This is the same system that the bankers use. Two examples of the application of that would be a very simple one, such as the turnaround time on letters. We established what was an excellent turnaround time and what was an unacceptable turnaround time and had the secretaries track and publish the results themselves. We have gone from about 50 percent on time to over 90 percent on time without having to say a word. This is simply because people seem to take pride in the work they do and make the corrective actions when they can see where the problems are. Another larger example would be using the system to rate both our own laboratories and private or industry accredited laboratories for their performance. The kind of variables we look at are the turnaround time, accuracy of tests, repeatability of tests, sensitivity, specificity and so on. While there may be many variables going into the final rating given to a laboratory, this makes it easy to decide which ones are good, and which ones require a little more attention.

Legislation

If you read Sanbury's book on government-industry relations in Canada, you'll see figures in there that indicate that the volume of legislation, both acts and regulations being passed, is increasing very significantly. In the area of agriculture that I am involved in, it has increased significantly but it has not been new powers. There have been three types of changes. The first is old acts which have been taken off the books - fewer variables to deal with. The second type of change has been to combine two or three acts into one act - again easier to manage. For example, the Meat Inspection Act was passed about two years ago and we folded into it the Canned Meat Act and the Humane Slaughter of Animals Act. All the powers are there, but there is only one act to deal with now. The last change has been to try to make the legislation simpler for our staff and for the client industries we deal with. There are two parts to that change.

The first is the bulk of an act, quite often is purely administrative, such as the laying of charges, the collection of evidence, the appointment of inspectors and so on. There is no reason why that could not be made identical throughout the dozen or so acts that we administer. The second change is in sister pieces of legislation such as the Meat Inspection Act and the Canada Agricultural Products Act which

cover foods other than meat or the Animal Health Act and Plant Health Act. We are amending these, and just finished the food ones; so that even the technical portions are identical where possible. It simply means that for our own staff and for a lot of the industry, the learning process is simplified. If your background is in the dairy business and you work for a company that is multi-commodity, then you will find it easy to learn the fruit and vegetable business or the meat business. The regulations should be very similar. What it has done is result in the passage of a large volume of material through the legislative process.

Partnership

At the federal level there have been several agencies involved in food inspection. Neilson recommended that we work more closely together and that we refine the interface. We have signed a memorandum of understanding with Consumer and Corporate Affairs which will delegate to Agriculture Canada, doing of work, on Consumer and Corporate Affairs behalf, in the agricultural plants. You should have one contact there. The laboratory work we do for Consumer and Corporate Affairs, is building on the strength and areas of expertise that we each have. Health and Welfare Canada is the umbrella agency that sets the basic requirements for health and safety in this country. We recognize that. We have been instructed to reference Health and Welfare's legislation so that we have uniform requirements. This has been done and we also have an agreement with Health and Welfare that we will do their work in the plants registered by agriculture to their specifications and feed them back information after the fact. In addition, we have agreed that Health and Welfare can come with us at any time and visit the plants, but we will do it as a joint inspection so that from the plant's point of view they see government rather than two agencies providing two sets of recommendations. The next step in that package is to go out to our friends in the provinces and see if we can't extend that kind of uniformity.

Communications

The world really has become a smaller place with fax and electronic messaging, but it has created some particular challenges for us in the food business. High visibility issues occur from time to time and in my experience they develop more quickly than in the animal or plant health area. They require a much faster response; otherwise they can get away from us in a very short period of time. An example is the finding of a residue in an agricultural food product, which we couldn't identify. The fact that it was an unknown residue resulted in condemnation of the food. Eventually, we found out that particular unknown was the breakdown product of a vitamin - quite harmless. While it was an unknown, it was a public issue.

The kind of things that we are doing with the other federal departments, and with the provincial departments and the industry, as the case may be, is as an issue breaks, we meet in an operations room at mid-morning. We meet at mid-morning because it gives us time to get out to the regions and check the regional newspapers to see what has turned up that morning. It allows us to contact the other parties of interest across the country. It also gives us time to get prepared before the public starts to call in, so at about ten thirty we have a meeting. Just before the meeting we put on an electronic blackboard the facts as we know them, and on a second page of the electronic blackboard we put an action plan of items to be done, who does them and by when, in order to deal with this particular issue of public interest. We found that if we do the homework properly, we can be in and out of that meeting in about twenty minutes. We also set up a conference call with our own staff or other parties of interest across the country that we need to stay in touch with.

There are two items that always go into the action plan. One is the appointment of a single spokesperson, who has credibility, who's knowledgeable and to whom we funnel all the information. We try to get somebody who's good both in English and in French. The other point that always goes in the plan is to have our own media people raise for us from the public's point of view the toughest questions they can come up with. So that we can get into the action plan some control or preventive action and so that in preparing our own questions and answers to respond to the public we have thought out the points that are likely to be raised. We go through a checklist when we are preparing the action plan and the checklist has been prepared taking the lessons learned from the Tylenol issue and the Bophal issue. But I simply raise that because I think it is an indication of the type of activity we are going to see for the future.

Import, Export Systems

With respect to exports, it is difficult to negotiate, starting from scratch, animal, plant and food certificates with 100 to 140 countries. What seems to be happening all around the world, three international bodies are setting the bench-marks from which we start to negotiate. In animal health it is the International Office for Epizootics, who recommend international standards for animal movement. In food it is the Codex Alimentarious Committee, who set international standards for food, and in plant health it is the International Plant Protection Convention under F.A.O.

On imports, we wanted to be equitable to our own industry in this country and ensure that the product being imported at least meets Canadian standards. We built a computer system that uses the International Standards Organization sampling plan to select the products at the port of entry that should be inspected. The kind of criteria they use are an assessment of risk, the country it comes from, the reputation of the company it comes from and the nature of the product. For example, if it is food, is it high acid or low acid? Based on that, the computer makes a decision on whether or not it

should be inspected and if it should, what is the sampling plan. It prints the form and it advises the inland port of entry. That is in place now in British Columbia and is being moved across the country, province by province, on meat inspection first, and on other commodities in a second period of time.

Conclusion

The public charged us with providing them with safe and wholesome food back around 1906 or 1907, when the first food inspection legislation as we know it today, was passed. My perception is, that work has been well done; however, the public's desire and the public's knowledge has passed on to a new level. They are no longer concerned with visible cleanliness and wholesomeness. The public's concern seems to centre on the real or perceived invisible threats through food, for example, residues such as bacterial residues or chemical residues.

Now, I use the term *perceived threat* very carefully. The Environmental Protection Agency in the U.S. conducted an analysis of determining how the public see risk. Risk was defined by the EPA as having two parts. The first is the scientific definition of risk. In food inspection it would be the number of people who become sick or the number who die through food poisoning. But the public perception of risk apparently is quite different. They very often don't know the scientific facts and the public perception is predicated on a number of variables. One is, do they voluntarily accept the risk? If they don't, they tend to be outraged. Have they control over the levers of power that determine whether there is a risk or not? If they don't, they tend to be outraged. Do they see the division of benefits and costs as being equitable? Am I getting the benefits and are they getting the costs? If that is their perception, they will be outraged. The public tends to accept risks that they are familiar with, such as low technology, much better than risks they are not familiar with such as high technology.

Irradiation is a good example. Most of the scientific authorities have recommended that irradiation be used because they feel it doesn't present a hazard to health. That is the scientific definition. The public perception is quite otherwise and if you use those variables I have just given you it becomes understandable.

The last item of the public's perception of risk is the distribution of the risk over time and over space. For example, in a case of food poisoning, if a hundred years ago we all produced and consumed our own food and had very occasional cases of food poisoning spread across the year and across the country, it didn't create a public perception of an issue. On the other hand, the production and processing of food is concentrated amongst a few large industries, so if there is an outbreak it tends to be concentrated both in a geographic place and in a time. The mussels case, for example, broke in Montreal and it broke in a specific week so the concentration in time and place seems to focus public interest.

The Future

Because the public is now placing emphasis on the invisible risks, I see two moves. One, increased testing of foods in the government laboratories but very quickly moving into increased laboratory testing of foods in the plants. We will move several tests into the plants so that, the work can be done without the down time associated with sending specimens to an outside laboratory.

QUESTIONS AND ANSWERS

Q. What work is being done to harmonize food standards between the EC, Canada and the U.S.?

A. I realize I am walking into a trap when I say this but let me say it in any event. Because Canada is so close to the United States, our standards tend to be very similar to the U.S. We simply do a lot of business with them, they are bigger than we are, and in consequence we tend to have rather similar standards. For example, in meat inspection, they recognize our system as being equivalent to theirs, while it is not identical and never will be. The constitutions of two countries are different. In terms of the EC the best hope, I think, of getting similar standards in the EC and in North America is through the international standards setting bodies. The reason I suggest that, is a country like Canada really doesn't have the kind of clout that the EC or the United States has in negotiations around food standards unless we can become part of a larger international-setting body. The agencies I mentioned a little while ago are the Codex Alimentarious on food, the International Office of Epizootics in animal health and the International Plant Protection Convention on plant health.

One other comment about the EC. The EC in food inspection tends to have gone in a slightly different direction from North America. In North America, costs have been a conscious factor in deciding on inspection systems. In the EC, costs seem to have been a less limiting factor. The other difference that I see in the EC is they have had public issues that have not been quite so visible here. For example, the issue of hormones in meat. They have had two large public issues that I recall which moved the issue of hormones in meat out of the scientific ambit and into the public perception ambit. Remember, the factors we discussed a moment ago, the Lamay Committee on residues in meat recommended some which were safe and some which should be banned because of the public perception and because of an issue which had occurred historically. My perception in Europe is they will be very restrictive on hormones, for example.

BIOGRAPHY

JOHN BRIAN MORRISSEY

John Brian Morrissey has been Assistant Deputy Minister of Agriculture Canada's Food Production and Inspection Branch since September 1986. This branch has four principal areas of responsibility in the agri-food industry--Plant Health, Animal Health, Human Health and Safety, and Food Quality and Assurance.

Before his appointment to this position, Dr. Morrissey was Director General of the Food Inspection Directorate, a position he had held since September 1980. From April to September 1980, he was Director of the Animal Health Division, where he was responsible for the Disease Control, Import/Export and Regulatory Affairs Programs.

Farm and Rural Society Panel

GEORGE BRINKMAN
Professor
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What I will attempt to do is provide an overview assessment of the main factors influencing farming and rural society. If you are interested in a more detailed analysis I would like to refer you to the paper contained in your conference binder. I am going to begin on the assumption that we are going to be here first of all, and that we will not be beset with nuclear war or a major catastrophe.

There are four major issues that I would like to talk about. First of all I would like to address what I see as the supply and demand balance for food because this is going to be crucial in terms of whether you as farmers are going to face a profitable environment. Then I would like to look at the growing integration both domestically and internationally of agriculture in the political economy of countries. Thirdly, I will look at the changing nature of the farm and finally, I will look at the urbanization of rural areas. All of these factors will have some impact.

We heard this morning in Gerry Trant's presentation, some of the global demand factors. The world's population is expected to double within a not so long period of time, which is going to place tremendous pressures on our systems. David Suzuki has talked about the environmental effects that we are facing today. I think both of these issues are going to be very crucial, but I also have faith in the ability of our scientific community to generate a capacity within agriculture to produce.

We have faced, for as long as I can remember, the issue of whether or not we will have enough food. If you look back at the writings of the 1930's, the 40's, the 50's and even the 60's, the issues have always concerned population growth and our capacity to produce food. It has always been there, but we have found that our technology has been able to increase not arithmetically but geometrically. The studies we have done on the value of agricultural research demonstrates that we have a tremendous capacity to produce. Yet we have to recognize that this expansion in the level of agricultural production has occurred during a time period when we have had long-run declining returns to agriculture. We have never really challenged our farmers. We have never really turned them loose.

I follow the question that David Suzuki asked, if you ask your forefathers, what size of cod and what size of lobsters did they catch, compared to what we catch today. Also ask your forefathers, what corn yields did they have, compared to what we have today. We have applied science in a very favourable way in agriculture. Some of the other elements in our society have not yet mastered that. That is to say we do have problems with the environment. These environmental issues will have to be dealt with. But, I believe we will be able to deal with them in the same way that we have been able to deal with production.

Let me shift now to the growing integration of agriculture, domestically and internationally. One of the things that we have noticed in the 1980's, is that agricultural production, policy, and profits in a given country are not affected solely by that country's actions. We have seen agriculture become more fully integrated into the international economic environment. The policies of other countries in fact determine to some degree the returns that we obtain from grains and livestock production. We have seen now a change in the nature of the way the world operates. We are one of the few developed countries in the world with a domestic market of less than 50 million people. What we have seen now is a change in the orientation of agriculture.

We are seeing negotiations under way to reduce trade-distorting subsidies, to increase the openness of markets and develop production based on comparative advantage rather than domestic treasuries. Granted the drought in North America has, in my opinion, severely dampened the enthusiasm and commitment to these issues. However, it is very likely that surpluses will reoccur if policy changes are not made.

We are seeing now under way a mechanism which can establish internationally through negotiations, agreements on the kinds of policies that may be acceptable internationally. This is not a partisan issue because we are dealing now with international trade. These are multilateral trade negotiations and they are just as applicable to what John Turner talks about in terms of his expanded international environment as they are to Brian Mulroney. We could be seeing the establishment of guidelines through international agreement which would affect the further integration of agriculture into the economy.

The decline in significance of agriculture as a distinct sector will likely bring about a change in the way we see agricultural policy. What we are apt to see is more dependence upon such things as macroeconomic and environmental policies. Today we have become very aware of how important trade negotiations for agriculture can be. In many cases there is just as much impact from interest rate policies, inflation control policies, taxation and exchange rates. The agricultural sector has had very good access to the Ministers of Agriculture. We are just now learning how important it is to have access to Ministers of Finance, External Affairs and those involved in taxation. If you want to look at the

direction in the future that is where I see the direction for political action.

Let me shift now to the changing nature of the farm operation. Many questions have been raised about the survival of the family farm. I believe that the family farm will survive. If I look at the hardships that have occurred in the 1980's, I see the problems there as being sectoral, regardless of what kind of business operation. There is no question that family farms now are showing that they are vulnerable to high debt load. The situation was the same in the 1930's and we still have family farms. In the future we will see some changes in the way farms are financed. We have talked a lot about equity financing, share operations or the farm operations leasing from non-farmland owners. I see growing importance of this but I do not see that displacing the family farm ownership.

Traditionally, in agriculture our returns have depended on two things: our return to capital which has only averaged about two to two and a half percent and is not competitive with non-farm returns and a second return that comes from capital appreciation. Without rising land values, agriculture does not generate proper returns and the corrections that periodically occur such as have occurred in the 1980's are apt to reduce the extent that you will find non-farm investment. I see also that we are likely to have a very sophisticated form of management. If you are not a good manager in the next ten years, you might as well forget it. Management is going to be what makes or breaks the farms and it has for the last ten years. It is no longer good enough to be a good producer, but you also must be a good financial and marketing manager. It is going to get more sophisticated and even more volatile in the future.

I see that we are likely to have farms that are operated on a family basis but on multiple family units. We may see a different kind of family farm but one that is still family oriented. If you look at the 1981 to 1986 census, the share of farms that consisted of non-farm corporations stayed at four tenths of one percent of all the farms, controlling only one percent of the assets. Canadian agriculture is not being taken over by non-farm corporations and I do not see it in the future. If we look at the evolution of farmers, however, I think it is very possible that we may be surprised at the number of farms we really need. 300,000 farms are now reported and the production on these farms could be produced on anywhere from 50,000 to a 100,000 farms. It is very likely that in the next one hundred years we may see only 30,000 commercial farms operating in Canadian agriculture. That is not to say that there won't be other farms. There will be part-time farms, and hobby farms and a variety of other mixtures. If we look at the core group that really produces, I think we will likely see a smaller number than today, but operating with sophisticated and incredibly astute management.

Let me change now to the last point that I want to make and that deals with the urbanization of rural areas. I think that we are likely to see continued urbanization. If we put this as the back-drop for how we see agriculture emerging, we are likely to see a decline in the rural way of life. I see the concept that might be described as a disperse city becoming more apparent where we have urban services that people in rural areas demand but rather than getting them in a single city they move from one community to another. One community will have specialized finances and shopping centres, another one will have housing or access to building supplies. People will commute to get the services just like you do in a major city, and yet it will not take any longer to drive between two or three rural communities than it does to drive across Toronto. I think that we will see the development and the delivery of urban services into the rural areas at an increased rate.

In terms of a conclusion, I see from the standpoint of agriculture a capacity to be able to feed the world, although we may have some ups and downs and some difficult times for short periods. I see the growing integration of Canadian agriculture and other agriculture systems, domestically and internationally. A decline in the relative importance of farm policy and a growing urbanization in rural areas. What this raises is a question of what kind of role will we have for the Minister of Agriculture? In one hundred years will we have a Minister of Agriculture?

I do not think we are going to see a change within twenty years, but it is very possible that within fifty years that we could see a change in the nature in the way we view agriculture with a Minister of Countryside Development concerned with the issues of environment, social welfare, open space and maybe even food security. Commercial agriculture policy may be handled in terms of macroeconomic policies within Ministries of Finance, environmental policies handled within Ministries of Environment and commercial policies handled in a Ministry of Economic Development. The question is how do we deal with these kinds of challenges?

If this is the kind of evolution that we see, it is the sort of thing that we in agriculture will have to become sensitive to. We have got to be aware and willing to change the way we operate, both in our lifestyles, our production and in our political activities. Our access to the political process is going to be very important. To be successful in agriculture, these are going to be the crucial areas that we will want to be aware of, modify and adapt to.

DON KNOERR
President
Canadian Federation of Agriculture

One hundred years to anticipate in fifteen minutes; how to do it is my problem. I first thought I would try being an economist. That is easy. You take past trends, feed them into your computer, program the computer to project them forward and bingo, out comes revealed truth! I will show you.

In 1931 there were 728,623 farmers. In 1986 there were 293,098. That means we lost 7,918.63 farmers per year. Over the next 100 years we will lose 791,863 farmers. 293,098 - 791,863. = oops that is a negative number. Farmers may be in the hole much of the time but I don't think that will work.

No problem, we will change the assumptions. During the last 55 years we lost 59.8 percent of our farmers. By 2043 we will lose 175,272.6, leaving 117,825.4 farmers. During the next 45 years we will lose (45/55) x 117,825.4 or 96,402.6 farmers. That leaves 21,422.8 farmers in 2088. It is a positive number so we know its right.

Upon reading the agenda, I found that I was being preceded by an economist so I thought I should leave the numbers to him. I then contemplated trying the route of farm organization representative.

I could circulate the standing policy of CFA and OFA and advise you that if that policy was fully adopted, farmers would prosper and rural society would flourish for the next hundred years. And I would warn you that if it is ignored, we are surely headed down the road to ruin.

I would have a pretty strong case. Farm organization policy is based on the collective wisdom of Canadian farmers. What better authority than that. However, I am being followed on this program by a farmer. I thought I had better let him speak for himself.

So I was left with only one choice. That was to try to be honest and admit that I really didn't have much of a clue as to what farms will look like one hundred years from now. That is not just an admission of poor prophecy skills. It is also a realization that at this point we can't know because the future will be shaped by decisions that are not yet made. There are trends that shape the future, but we also have choices about the kind of future we want. And it is the choices that I would like you to think about.

The Current Picture

Despite intensive operations separated from the land, and significant variation in ownership structure, I see a land based, family owned industry composed of a large number of relatively small units.

Returns have not been large enough to attract much venture or risk capital. Farmers, in the main, capitalize their operations with savings or borrowed funds. This creates a particular type of financial risk.

Farmers live and interact with others in a rural society which, although it is changing, is significantly different than the large urban society where most Canadians live.

Agricultural technology has changed dramatically and there are no signs of a slow-down in this trend. This is one of the factors contributing to the increasing interaction of farmers and the rest of society on environmental and other issues.

There is a significant interrelationship between farmers and government. Government plays a major role in many areas, all the way from extension and research to marketing structure and income stability.

Canadian agriculture is highly dependent on export markets but we sell the majority of products in the domestic market.

Looking Ahead

In order to think about our choices for the future, I will take some of these characteristics of our industry and think ahead. Specifically I want to discuss land, ownership structure, financial stability, rural society, technology, and trade and the market environment.

Land

Despite revolutionary possibilities in technology, I can't with any confidence predict that the world won't still be primarily dependent on the land for its food supply in 2088.

Thus the land that is available will, in all probability, be a major factor in determining the future possibilities for Canadian agriculture. For example, while we may or may not find it profitable to grow tender tree fruits a hundred years from now, we ***will not be able*** to grow them if we don't have land with suitable capabilities.

Good agricultural land is often in high demand for other uses. Crops flourish in areas with good topography, good water and good weather, so do humans. No one wants to be told where they can live, but there is only so much land to go around. We are being faced now with some very important choices.

1. The first possible choice would be to let the urban centres grow in whichever directions they will. The consequences of that decision are obvious. The land base available for the production of food would continue to shrink. That means we leave the future generations with larger populations to feed and less land on which to produce that food.

2. The other choice, and I think it is the best one, is the institution of controls on land use to curb the loss of high capability agricultural land. This will require strong and painful political decisions. But we know the consequences of not making those decisions.

Ownership Structure

My views on ownership structure are very similar to George Brinkman's. The Canadian family farm has survived dramatic technological change. In the past we have made a conscious effort to protect the family farm, but is that the ownership structure that we want in Canada in the future, or are there options? In this area we have already made some choices.

1) While the state farms of Russia may have been necessary to breakdown a feudal system, we have not chosen this system as a model for our agriculture industry.

2) We have also decided against large-scale tenant farming which has its roots in a different historical and social pattern than Canada's.

3) Another alternative is corporate structures with investors, rather than farmers as owners. These exist now more frequently in U.S. agriculture, an agricultural sector not so different from ours.

   However we, in creating supply management for poultry and eggs, appeared to have rejected the employment environment, ownership opportunities and regional distribution created by the corporate structure in that sector in the U.S. And that choice may not be an option for Canada's horticultural industry. We do not have large blocks of high capability land and the migrant labour force which has facilitated large-scale horticultural operations in the western U.S.

4) Without rejecting the possibility for corporate farming in Canada, I believe that we still need to provide a climate which is favourable to the maintenance of moderately sized, family farms.

Financial Stability

Canadian farmers hold more than $22 billion in debt. This is a case where the consequences of choices made some time ago are being felt right now. We have been trying to find immediate solutions to deal with this debt problem.

Long-term credit policies on the other hand won't solve the debt problem of today; however, the choices made in that area today will have a significant effect on the farmers of the future. We have been presented with a number of choices.

1) Equity financing, finding an outside source of risk capital to finance family farms, has received a lot of attention in recent years. In reality, it is the impossible dream. The only way it can be done, on any significant scale, is through corporate farms. As I have already mentioned, we have not yet chosen that structure for our industry. While some people are mesmerized by the paper capital gains created periodically by inflating farmland values, you cannot capture those capital gains on any large scale and maintain a stable family farm structure.

2) I believe that experience has shown that stable family agriculture requires that Canadians choose farm credit policy that will create a stable supply of credit at interest rates that are realistic in terms of agricultural returns to investment. If we do not make that choice, the fiscal instability down the road may commit us to a structural change in our industry that we may not like.

Rural Society

The question and patterns are different in Ontario than in areas like the Prairies. Here, the issue is not the disappearance of communities and shrinking populations. I would judge it is more a question of a changing population mix. In many areas the non-farm population is growing. Here, again, I see choices that can be made.

1) Choice number one would be to allow urban society and residential development to spread unchecked, into our rural areas.

   The consequences of that choice may be the isolation of farmers within an almost hostile society which does not support or even understand agricultural practices. The end result may be not only the destruction of good farmland, but restrictions on the agronomic practices of the remaining farmers.

   And it is important to recognize that although the fragmentation of farms into relatively small hobby farms or rural estates may keep most of the land physically available, it can create a situation where it is not economically possible to use the land for commercial agriculture. This can be almost as limiting on future possibilities as paving the land.

2) Choice number two is the development of both education and legislation to maintain our agricultural environment.

Technology

There is no doubt that, in order to maintain an equitable standard of living, farmers will continue to improve their technology. We have chosen to leave the horse and buggy behind. Since we made that choice, we have placed ourselves on the technological fast-track. But will we become victims of technology? Here, again we have choices.

1) If we choose not to get trapped between the inventive genius of company laboratories and an environmentally sensitive public, several things need to happen.

   (a) Means have to be developed to efficiently and effectively determine whether technology is acceptable before it is introduced. This means that risk information cannot be treated as the proprietary property of companies.

   (b) There has to be international harmonization of standards. But this does not mean necessarily accepting the lowest standard. There will be times when other countries must be required to come up to our standards if their producers want to compete in our marketplace.

2) If technological advances are to continue, Canadians will have to recognize the need for increased and effective agricultural research. Decisions will have to be made regarding the direction of research.

   (a) Will agricultural research be guided entirely by probable profitability? If so, what are the consequences? If research is only conducted when it is expected to result in a profitable product for a company, some very important projects and sectors of our industry may be overlooked.

   (b) Will equal consideration be given to all potential research projects? This will require a strong government role in agricultural research.

Trade and the Marketplace

Although George Brinkman has spelled out the logic of trade and marketing fairly well, I think it is important to consider our options and to review our history. In the very recent past, how many times have we heard that Canadian agriculture must be sensitive to the dictates of the market and adapt to the trade requirements of an increasingly interdependent world? We are told that we have to choose between our distorting domestic policies, and an industry fully directed by the "free market."

The problem here is that we have not been presented with choices that are totally realistic. Canadians have been faced with these choices before, all we have to do is turn around and look behind us.

Throughout Canada's history our agricultural policy has been highly influenced by the need to find export markets for a substantial portion of our production. It has also recognized the need to maintain a balance between supply and demand. Less than one hundred years ago Canadian farmers were almost totally guided by the market message without government intervention (at the mercy of the marketplace some would say). Our current mix of marketing structures, policies and programs are a direct product of that market experience and the problems that occurred.

The point I am trying to make is that the awareness of the importance of trade and the need to balance supply with demand is, by itself, no cause for choosing to discard a policy or to accept a specific trade agreement.

Conclusion

By now my reaction to change is probably becoming apparent. I find that as far as change goes, I am a small "c" conservative. I, like most human beings, am reluctant to commit myself to major change.

As a parent, I have discovered that even with all the wisdom that comes with the job, I can't really anticipate what the next generation is going to decide. What I can and must do as a parent is try and ensure that my children have reasonable options available to them when they are making their choices.

I don't believe that we can begin to anticipate all that will occur over the next century. But what we as farmers of today have to realize is that choices we make today will have a profound effect on what we leave for the farmers of tomorrow.

When we make decisions about our land base, our ownership structure and financial and marketing policies, technological change and agricultural research, let's be sure to leave as many good options as possible open to our children. Are we going to box in the future, or are we going to work to ensure that we leave a strong, healthy, broadly-based agricultural industry?

I just have one further comment and it is really in response to what George Brinkman said. A lot of people ask why is agriculture different and why do we have a special relationship with government?

For example, why are farmers not treated the same as we would treat Noranda, which is also a resource-based company, dealing with land resources? Farming is very unique in several ways. It is the only sector in Canada where a relatively large number of individuals own, manage and to a certain degree, control the future of what is considered a public resource, the land. They deal in what is psychologically, if not in reality, considered often the most important commodity we produce in our country.

Our family farm structure is very unique in terms of primary business production enterprises. The attempts to compare a family farmer to a small businessman, who is basically a middleman or a provider of service, ignores the fact that we are primary producers and our basic resource, the land that we own, is not transferable. Before we decide that the best way to treat agriculture is just to integrate it and make it part of the general economy. We might want to consider the social rules and public controls that would have to be instituted to maintain this land base.

PAUL MELDRUM
Dairy Farmer and TV Host

When I was asked to address this group I wondered why. While listening to Dr. Rennie's introduction the answer came to me. They wanted to hear some damn fool who just started into agriculture explain why in God's name he decided to go into farming. I don't know if I can answer the question, but I know farmers ask themselves the question whenever the silo unloader breaks, a cow has a sore hoof, another cow breaks the water bowl, the tractor won't start, or the milking system shuts down. This all happens after we have come home from our full-time jobs and are trying to go like the Dickens to get the milking done so we can eat supper before 8:30.

Given the swipes that Dr. Suzuki has already taken at economists, I am going to stay out of that realm. I am glad to see that he didn't take any shots at the journalists or at farmers. In fact, he was quite full of praise for farmers. Last week, in my home county of Stormont, the Premier showed a video which I had the good fortune to produce, and it was a video commemorating the 100th anniversary of the Ministry entitled, Reflections of the Past, Agriculture in Stormont County.

In making the video we talked to people who had experience in farming, who had seen many different changes in agriculture. We also talked to someone who was just becoming involved in agriculture. We looked at the past to see where we are going in the future. As Dr. Suzuki pointed out, speaking to elders is valuable. You can learn a lot from the people who have come up through the farm community, from the people who have gone to the school of hard knocks and have paid their dues.

In making the video I noticed the social changes in the agricultural community. If you drive around your home county, you'll see what were once thriving small farm communities with stores boarded up, though people still live there. There still might be a store and perhaps a restaurant, but they are not the communities they once were, with the exception of a few in the county. There was a time when these rural communities were very close-knit.

Once you were established in the community you had at your disposal a social network that may not have been as organized as our social agencies are in the city, but they were every bit as effective or perhaps more effective. The local town provided the services a farmer needed and also much of the social life. You knew your neighbours, you knew who they were, you were dealing with your neighbours, you were buying your food from them, you were buying your tools and your machinery from them. Farmers in a sense were keeping these town going because they were not only selling their goods there, but buying everything they needed to take home and continue with their farming operations. This is no longer the scenario.

The small towns have diminished in size as the number of farmers has decreased. Technological change is the main reason farm numbers have decreased. Tractors permit more land to be ploughed by one farmer, tile drainage permits earlier access to the land. Better varieties, herbicides and pesticides have also increased productivity. In the livestock industry, where I am involved, we have artificial insemination, which has increased the productivity of dairy cattle immensely.

All of those things have made some farmers redundant. We have become so good at farming that we have produced ourselves out of jobs in many cases. We no longer need the number of farmers we had before. We have more specialized farms. We no longer have the mixed farms. We have become much more productive. This is a trend that I believe is going to continue. I think it is a trend that is been going on long before my time and will most likely continue long after I have gone.

Other things have had an impact on the rural community. Number one is the automobile. The automobile has certainly made the world a smaller place. Once a trip to the local town was a major outing. Everyone looked forward to it. With automobiles it is nothing to go into the city and avail ourselves of the cultural activities and the entertainment there. And access to the city has raised in young people's minds the possibilities of obtaining the easier life of the 9 to 5 jobs in the cities.

Television has also had a major impact. Television brought the nation and the world into our livingrooms. Television has educated us, perhaps not too well, but it has educated us through sitcoms and the advertisements. Television in conjunction with the automobile, has brought about a dissatisfaction on the part of a large group of young people with the rural life and with farming life. Television has changed our values. It has given us a new definition of success.

At one point, people on the farm might have felt that success was having a herd of cattle, or growing good crops and being successful at keeping the bankers away. Today, that is not good enough. You have to have a shiny new car, you have to have the microwave, you have to have the VCR and leisure time.

Success in many ways is measured in leisure time, which as I just said, farmers do not seem to have an overabundance of. That in itself creates a lot of dissatisfaction and I have seen a lot of young people who have said, no I do not want the life that my Dad had or my Mother had. I do not want banged up knees from bending down twice a day, seven days a week, three hundred and sixty-five days a year to milk cows for a marginal return. I don't

want to have my children go into farming and put that kind of effort into an industry about which most people don't care. So, they are opting out of agriculture. A few fools like me are opting in and I will speak about that later.

Where does that change in attitude leave the farming community? Today, we represent 3 or 4% of the Canadian population and the percentage is decreasing. Our political clout, is diminishing yearly. Hugh McLenan wrote, years ago that Canada was two solitudes; English and French. I submit that we now have two cultural solitudes, farmers and non-farmers, or rural and urban. That leaves us as farmers with less political clout. We are dealing now with the public, members of which may be four or five generations removed from the farm, who know little about farming and really have little concern about where their food comes. They don't want to associate a hamburger or a steak with an animal that has four hoofs and a beating heart. They would rather see their meat packaged in a nice cellophane wrapper with white styrofoam ready to be taken home and plunked into the oven or on the grill.

Many people are also uneasy with the fact that milk comes from the body of a cow. We have had people come into our barn and actually go squeamish because they saw milk coming out of a cow and out of the milk tank, but because of certain laws I certainly would not offer it to visitors. Many even got squeamish when they saw me drinking milk from the tank.

I recall a story I heard in the course of making a feature for the CBC on artificial insemination and how it revolutionized the livestock industry. I interviewed Mel Thomas who worked as one of the first AI technicians, for what is now Eastern Breeders. He told me, that then, they were not too fussy. They would catch a cow out in the field. The farmer would tie the cow up to a fence post, and the technician would breed her there. Well, Mel was doing this thing, by the side of the road when two ladies came by in a car and screeched to a halt. They jumped out and demanded to know what this fellow was doing to that poor cow? I think this state of knowledge still persists.

We in the livestock and dairy industry take AI for granted as a technique to increase productivity. However, when I have shown this technique on television, I have gotten some flack from it. My father told me long ago that when you are doing something worthwhile and someone is giving you some flack about it, the appropriate course of action is to agree with them and go ahead and do what you are doing anyway. I have done that on a number of occasions and I am still alive to tell about it.

People for the most part don't have a clue where their food comes from nor how it gets to the table. There is a paradox here because at the same time there is a growing awareness or an increasing concern about what inputs go into the production of food. I think Dr. Suzuki mentioned it, the use of herbicides, pesticides, antibiotics in feed, and there is a growing concern about the use of these kinds of inputs. At the same time, these people don't know why we are using them, although there is a lot of information as to the benefits they derive from these inputs. These people have vocal support. We are losing political clout, even though we do have farm organizations like the Canadian Federation of Agriculture. I think, as future farmers, we will find it more difficult to get the ear of the government.

Dr. Brinkman made the valid point that we no longer need only to capture the attention of the people in the Ministry of Agriculture. Now we have to go to the other ministries as well. That is something that we may have difficulty doing, if we don't have support of the general community. My suggestion is that we need to go on an incredibly extensive, educational and media blitz.

Most Canadians get their daily information, in the media. The media has become the opinion leaders in our country, not the politicians. The media helps us form opinions on everything from politics to abortion, and just about everything else. In a restaurant you'll find that most of the conversations are prefaced by "well I heard on the radio yesterday", or "I read in the paper this morning", or "I saw on the news last night." Therefore, we in agriculture cannot ignore the impact and the power of the media. It is a tool that we must use. I don't think that we can use it by using programs like mine or like CBC Radio Noon or the Eastern Ontario Farmer or Farm and Country. Through those programs we are preaching to the converted. We have to get into the media where there is now little or no agricultural reporting.

Believe me, there are a lot of media outlets that don't have a full-time agricultural reporter. For example, the Ottawa Citizen doesn't have a full-time agricultural reporter. I asked one of their editors why they didn't consider some agricultural reporting. He told me that there was not a need for it, there was not a demand for it, their public was not asking for it. They only ran an agricultural story if it was cute or sensational. To me that is an incredible criteria to use in deciding whether or not to run an agricultural story. This in an industry that comprises about twenty percent of our exports and I believe what one fifth of all the jobs in this country are indirectly or directly related to agriculture but, nevertheless, that is the attitude.

Last year the Ministry of Agriculture started an agricultural journalism program in the Agricultural Technology College System. I believe that merits our support and should be expanded. However, I would hope that the graduates from that program are not all funnelled into the traditional farm media because we need people in the regular media to interpret what is going on in the farming community. In this way people in the general public would have an inkling why farmers complain as they say we always do, why farmers want certain policies changed, why their chemicals and pesticides and why their animal welfare practices are as they are. I also suggest an education program, agriculture in the

classroom. I know that the Ministry of Agriculture is working on this. I have spoken to Brian Doidge about it. It is nice to see someone that is actually a teacher, an educator, in on the ground floor of planning the program to get agriculture in the classroom.

I am not a proponent of the socialist system or the communist system in the Soviet Union but I think you can learn from them in one respect. When someone takes power or when they are trying to change a political system as they did in Russia, there are two things that they do immediately. First they take control of the media and second, they take control of the educational system. They start to indoctrinate children. I am not proposing that we flood our schools with agricultural propaganda, so as to have the students march out yelling, "Justice for farmers." However, it is too late to start the education effort with adults, who already have set ideas. The time to influence people's opinions is when they are young. I think you can do this in the schools and I think you can do it in an instructional, rather than a propagandistic way. When they become adults living in the city. They could well have an understanding of why farmers operate the way they do and what goes on, on the farm.

I told you I would talk about our family farm. Six years ago we made a conscious decision to get into farming. My dad was brought up on a farm. We had a hobby farm just to keep my dad satisfied. After my dad had open heart surgery, he realized that if he ever was going to farm full-time he had better begin. So we made a conscious decision to go into farming.

We asked ourselves "What kind of farming are we going to go into?" Well, we like cattle, but (apologies to Don Knoerr), we decided not to enter into beef farming because we didn't think we would be able to make a good living at it. So we looked at supply managed commodities. We realized that we didn't enjoy working with chickens. We like cattle and we like dairy cattle. We realized that dairy quotas were costly, but we also knew that with a supply managed commodity that we had a good chance of eventually making money. We knew that we were going to get a monthly income once we started milking. We knew that if we kept our costs down we would be able to make a satisfactory income, even though at that time we had no experience in dairying. We didn't go to a bank because we didn't want to borrow a half million dollars, start dairy farming with no experience and lose it. We decided to finance the farm slowly by working off the farm. I believe that is a trend that is going to expand in the future. We see a lot of it now but I think out of necessity it will expand; because farmers want the same standard of living enjoyed in the cities.

Farmers don't want to sacrifice the standard of living for their children, simply to put food on city tables. I don't mean to be blunt about this, but I believe that I have as much a right to a good standard of living as much as city folk have. I could probably quit my job now and farm and be, I suppose, comfortable but relatively poor. I am not willing to do that so we continue to work off the farm. We hope that someday we will be able to give up our full-time jobs and only have one full-time job, farming.

I believe that the family farm is probably the best way for agriculture. I am not sure that is the way it is going to continue. Farmers in the States, to whom I have spoken, look north with envy and say they see our farmers still working in cooperation with each other. Down there one farmer is trying to put his next door neighbour out of business. I hope we never get to that point. I believe that a company cannot replace what the family farm does with respect, care of the land and the animals. If we are to address the concerns of the public in terms of animal welfare and land stewardship I think the family farm is the way to go.

I will leave you with this quote of Howard Malcolm, which I heard several years ago on CBC Radio Noon. Howard Malcolm is a reporter for the New York Times. He wrote a book called, Final Harvest an American Tragedy, which dealt with an incident, in I believe Iowa, where a farmer shot his banker because he was going to be foreclosed. The banker detailed all of the troubles in the farming community. On the program he said that, one didn't have to be an historian to be able to look back at history and know that all civilizations, all great civilizations, began to fall when they lost touch and severed the ties with their agricultural roots. I firmly believe that Malcolm's correct. Agriculture gave our society a very strong set of social values and morals. If we are to continue as a strong, healthy society we cannot lose touch with our agricultural roots.

PANEL QUESTIONS AND ANSWERS

Q. Do you think that it is a crime that you do have to work off the land to make farming viable?

A. (Paul Meldrum)

When I produced that video, one of the people I spoke to was the previous owner of the farm that we began by renting and later purchased. He is 88 years old and still lives on the farm. I have learned a lot from him. He told me that even though he was a full-time farmer, he worked off the farm on many occasions to make ends meet. His wife took in boarders, especially during the thirties, to try and keep enough food on the table. I don't know if that is going to change. I don't know if we should expect farming to pay without working off the farm. I think it should pay reasonably well, but I am also afraid that if it pays really well everyone and his dog is going to get into it and then I am going to be forced out of it.

Q.

I would like to receive the panel's comments on the proposition that there is in Ontario, if not

elsewhere in Canada, a policy and program vacuum relating to rural development. I would like to know who speaks for rural Ontario and who is going to integrate the various interests so that we can be assured that agriculture has a place in the whole?

A. (George Brinkman)

I think that I would agree with your contention that a lot of what happens in rural areas happens by default. Part of the difficulty is that we really lack a well-defined decision-making structure. If you look at agriculture you find that we have commodity groups that deal with commodities in an integrated fashion. We have federations of agriculture which deal all the way down to counties, townships and all the way up to the federal government level. If you look in rural areas we first of all lack that kind of structure and it has been lacking for a number of years. What are the commodities that we deal with in rural development? Well, they are health care, transportation, farm and non-farm employment, housing; those kinds of issues. Have you ever seen an organization of rural people for better health or of rural people for better housing They don't exist. There is no organization out there of rural people for better living.

Secondly, when we deal with the government on commodity questions we have the Ministry of Agriculture but questions relating to rural development, health, transportation, housing are spread out in other ministries. Ministries deal with urban people as well as rural people and because of this, there is a certain degree of competition for program funding. Let's face it urban people outnumber rural people. If we seek programs on the basis of political power, we do it as a minority power. I think it is very important that we recognize that until we get a better structure, until we develop better access points and a much stronger coalition of interest in the rural areas, then we are going to continue to be dealing on a basis of default. It is going to be very difficult to be able to compete very effectively on transportation policy. You remember what happened when the Minister of Health was closing down hospitals. Where did they get closed down? You know where they got closed down. Many of the rural areas understood what was happening, but the mechanism was not there to be able to support the rural interest. I think that rural people are going to have to wake up, recognize what is going on, change the nature of their political processes, form some new coalitions and be very active and proactive. It will become more difficult to continue to depend on political support and political power.

A. (Paul Meldrum)

I would just point out that the rural community as a community has changed. Earlier I noted that a number of farmers have left the rural community and both other panellists mentioned that they have been replaced in some instances by urbanites, who have moved out into hobby farms or want to live in a country setting.

In many respects, these new residents of the rural community have little or no contact with the farmers. They drive into the city in the morning, work all day, came back at night, have supper and maybe cut the lawn or do something in the yard or watch a movie and then go to bed. On the weekends they work on the deck or do some gardening and perhaps wave to the farmer and have a chat with him over the fence now and then.

I think it is difficult for the two groups to organize. You have got two very different groups, who really don't have a lot to say to each other. I think until they are really pushed they won't be forced to form an organization. I believe there is one called the Foundation for Rural Living, which encompasses not only farmers, but I think the non-farmers as well, in fact anyone who is interested in ensuring viable and strong rural communities.

A. (Don Knoerr)

I obviously don't know the specific political or legal situation in Ontario. My experience relates to British Columbia. Our valleys create a peculiar situation where everybody tumbles to the bottom and competes for the space. I think some of the basic issues are the same. The question of management and resources is a little different in B.C. but you have got some of the questions here.

Without disagreeing at all with what has been said, I would note that it is a question of what is development. A developer often is a man that develops farmland or a man who develops other quote, unquote unused land even though in fact it is being used for different purposes. Our development controls regulations or management in my opinion is to maintain or control the type of development related to expansion of residential centres. It doesn't look at the question of how are we going to effectively use the land resources in the rural community nor does it deal with these sort of social questions George is talking about. Now, we have the Land Commission Act and we have tried other approaches to integrated resource management in B.C. Quebec has similar legislation to British Columbia and you have your own controls here. But I think we are still a long ways from really looking at this resource base, the mix of people and the interaction between people and a physical resource. This is unfortunate because these matters must be considered in order to develop an effective plan for development. Without effective planning for future options available to agriculture will be dramatically affected.

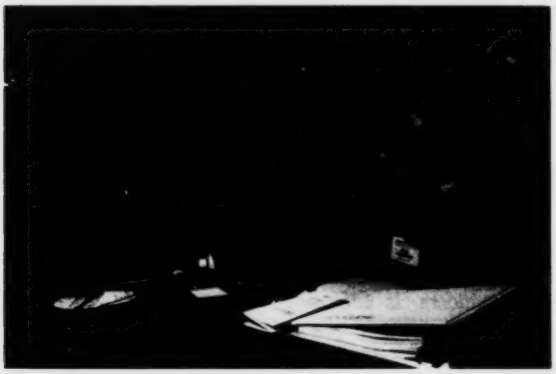
BIOGRAPHIES OF PANEL MEMBERS

GEORGE BRINKMAN

George Brinkman is Professor of Agricultural Economics at the University of Guelph. His areas of specialization are agricultural policy, farm structure, agricultural productivity, evaluation of public programs and rural development. In 1982, Professor Brinkman was President of the Canadian Agricultural Economics and Farm Management Society. Since 1985, Professor Brinkman has been Chairman of Statistics Canada's Advisory Committee on Agricultural Statistics and is serving on the Advisory Committee for the American Agricultural Economics Association magazine Choices.

DON KNOERR

Don Knoerr is President of the Canadian Federation of Agriculture. He is a member of the Advisory Committee to the Farm Credit Corporation. He is also a member of the federal government's Advisory Group on International Trade for agriculture, food and beverage products. Don Knoerr is from British Columbia where he operates a cow-calf beef enterprise in partnership with other family members.



PAUL MELDRUM

Mr. Meldrum is currently the producer and host of a weekly half-hour farm show called "The Valley Farmer" which originates from CJOH TV in Ottawa and is broadcast throughout Eastern Ontario, Western Quebec and upper New York State. Mr. Meldrum is also a full partner in his family's dairy farm, which they started from scratch six years ago. His parents, brother and wife all are active in the farm. They all work full-time off the farm as a means of financing the start-up costs. The Meldrum's are presently milking 30 Holsteins and their goal is to milk 60 Holsteins and sell breeding stock.

Synthesis

CLAYTON SWITZER
Deputy Minister
Ontario Ministry of Agriculture and Food

Ladies and gentlemen, I think you received a lot of good information from the speakers at this, the sixth annual OMAF Outlook conference. Over the years we have strived to get good speakers, and certainly this year I know we have succeeded. I am convinced that a lot of the value of the conference to you, and one of the reasons it gets bigger each year, is because you have the opportunity to talk to each other during breaks, and exchange additional information.

My role is to synthesize everything that you have heard today. I did not hear all the papers presented today, although I did read all of those papers that were sent in ahead of time.

The topic of today's conference was the Next Hundred Years, looking to the future. The Minister set the tone this morning very well. He indicated that, in celebrating our centennial this year, we in the Ministry have looked backward to the traditions of agriculture in the province of Ontario, and we have also spent some time looking into the future. Of course that was augmented by some of the information that was here today.

Thinking of the future, I would like to recognize that in the crowd today there are a number of young leaders of the future. There are a number of people here who are participating in the advanced agricultural leadership program. Paul Meldrum was one of those persons.

The timing of this Outlook conference was designed to coincide with a two-day meeting in this hotel of people in the leadership program. These people have demonstrated a commitment to addressing issues and to developing leadership. That meeting was called Building Together. It was planned by some of the staff at our Ministry, and by representatives of a number of agricultural organizations. I certainly appreciate their efforts.

The goal of our Ministry is to continue to emphasize the development of human resources in agriculture over the years to come. I count on, and I am sure rightly so, the cooperation of agriculture organizations, and of agri-businesses in our efforts to develop this human resource. We have developed in our Ministry a plan for the future. Everybody, whether you would be a farmer or in an agri-business of one kind or another, has a plan for the future. We devised our plan a couple of years ago, and of course as things change you tend to modify your plan.

I think that it would be worth sharing with you very quickly some of the thoughts that we have about our plan for the future. We base it on a concept that what the agriculture and food system needs for the future is an increased ability to compete on this continent, and to compete internationally. We base it on a concept of quality. We believe that one way to sell in any market is by providing quality products. We intend to do whatever we can do as a Ministry to enhance the quality of Ontario products. Again, we seek the help of the Ontario agri-food sector in achieving this goal.

We understand that financial stability, particularly for producers, is extremely important and we intend to keep programs in place that will provide, we hope, a safety net for financial stability. We also believe that the environment is of critical importance, and particularly the soil and water that provides the basis for agriculture in our province. We intend to continue to stress soil and water management into the future.

Finally, we underline, in our strategy, the importance of what I would refer to as education and training. I didn't mention the word research, but that comes as part of competitiveness. These are programs that the Ministry believes are very important for the future. In the Ministry, we are also contemplating our role, and the role of the whole government, in the area of rural community development.

I would, however, like to comment on the presentation of the very last speaker, not because Paul Meldrum was perhaps the youngest one up here, but because he hit the nail on the head. He outlined for us the general lack of understanding by the public about how food is produced, and I thought in a most eloquent manner. He talked about the concern that the public has regarding the input that many of us in this room would feel are critical to an efficient agricultural system. He talked about the role of the media, and how we in this room who are interested in the welfare of the agriculture and food system could perhaps use the media better than we have. My Minister, the Honourable Jack Riddell, and many of us in the Ministry, have been very aware of what I might refer to as public awareness, particularly in this centennial year.

The Minister has made use of the centennial year to talk to many groups about the importance of agriculture but often I think, as Paul Meldrum said, we are talking to the converted. How can we better speak to that 97 percent of the people in Ontario who don't live on farms or who do not know very much about where their food comes from.

Paul Meldrum also spoke about the importance of agricultural education in the classroom, and the importance of reaching people when they are young. We in the Ministry certainly recognize that, and we certainly would like to see even more of that done in the classrooms of Ontario.

To have a successful agriculture and food industry in the future, we need to develop even better educated, well-skilled, resourceful people. The important thing for a viable agricultural system in the future is the people who work in it. Secondly, we cannot forget the importance of research and technology transfer. This morning the Minister mentioned biotechnology. We in agriculture can't afford to let this be done by non-agricultural people.

We need to have the companies who have an interest in agriculture working in this area. A third point is the global demand for food. Gerry Trant talked about it and, I suspect, although I didn't hear him, David Suzuki talked about it. We have to be able to meet that demand. There has to be an economic environment out there that allows people to buy the food they want and need, and that gets into the big social issues that obviously are a very important part of the future. The fourth point that I am sure was talked about at great length, today, is the question of the physical environment. We must focus on the impact man has had on the environment, and what impact man is likely to have on the physical environment in the future. We must focus on how that is going to impact on the future of the agriculture and food system.

BIOGRAPHY

CLAYTON M. SWITZER

Clay Switzer received a M.Sc. degree from the Ontario Agricultural College (OAC) in 1953. He was granted a Ph.D. degree from Iowa State University in 1955. He joined the Department of Botany, OAC, immediately after graduation. He became Chairman of the Department of Botany in 1967, Associate Dean of the OAC in 1971, and Dean on July 1, 1972. He completed his second five-year term as Dean on June 30, 1983, and was appointed Deputy Minister, Ontario Ministry of Agriculture and Food on January 1, 1984.

He has been President of the International Turfgrass Society, President of the Ontario Institute of Agrologists, and President of the Agricultural Institute of Canada. In July of 1986, he was made a Fellow of the Agricultural Institute of Canada. In May of 1987, he received an Honourary Degree, Doctor of Laws from Dalhousie University in recognition of his contribution to the Canadian Agricultural Industry.

Banquet Speaker

BRIAN SEGAL
President
University of Guelph

In my short time as President of the University of Guelph, I have discovered that the agri-food industry is perhaps the most essential industry in the province and the nation. It is an industry founded on skills and knowledge handed down by generations of farmers for more than ten thousand years. Yet, it is an industry on the cutting edge of some of the most exciting advances in the scientific world. It is an industry that embraces economics from the farm-gate to international markets. It is an industry that requires the most sophisticated marketing techniques for its products.

The agri-food industry employs 1.5 million Canadians and generates $20 billion of wealth annually. It has reached a crucial crossroad. The direction it takes in the next few years will have widespread implications for the economic stability and security of our country. Agriculture has always been the basic foundation of the Canadian economy. If that foundation does not remain strong and prosperous, the country will be in grave difficulty.

I want to discuss the ways in which I see the University of Guelph working in active partnership with the Ontario Ministry of Agriculture and Food, and the agri-food industry in the years ahead. I am a newcomer to the industry. The more I learn about its scope and potential, the more I realize how much there is to learn. During my first week on the job at Guelph, the student newspaper published an interview with me and headed it "The Seagull has landed." I thought that was not too bad a start. Until the next day that is. While looking for some magic words of wisdom in the graffiti on a student washroom wall, I walked over to the hot air hand dryer and there was a little hand written message- "Stand back, press the button and receive a message from the president." One understands one's rightful place.

I would like to make a few observations about the Ontario Ministry of Agriculture and Food. By the way, university presidents are most respectful when they speak of their provincial government. Yet, in complete sincerity, I believe that agriculture has been very well served by the Liberal government over the past three years, particularly by the Honourable Jack Riddell. If you know Jack Riddell, you know that he speaks his mind. He has spoken on behalf of farmers and the entire agri-food business sector with passion, integrity and forcefulness. With the able assistance of Clay Switzer, he has introduced forward-looking programs that are bringing lasting benefits to the agricultural community.

The Ministry has strongly promoted the quality and freshness of Ontario food products, introduced legislation to ensure the right-to-farm, proposed a program to help young people begin farming, and amended the farm marketing and milk acts. These are only a few of a very long list. The two most significant initiatives of the Ministry have been Food Systems 2002, which is an initiative to reduce pesticide use in Ontario by 50 percent over the next 15 years, and the land stewardship program. More than six thousand farmers in this province are taking part in that program and those numbers will continue to grow.

In this month's issue of Life magazine, Luden Wainwright, a respected writer, published a column entitled, "A Need for Caring." In this column he talks about the notion of stewardship, which he learned about forty years ago in Sunday School. Wainwright was taught that stewardship meant protecting one's faith in the face of any challenge, as well as, preserving that faith for future generations. Now, forty years later, he observes that there can be no more important stewardship for all mankind than the stewardship of the land and the environment. Land stewardship eradicates pollution and preserves the land for this generation and all generations to come.

The Life magazine column was an impassionate plea for action. As I read it, I took great pride in the knowledge that in Ontario action is being taken. Here, scientists are visiting farmers across the province advising them how to grow abundant crops without pesticides. Here in Ontario, 6,000 farmers are taking courses on conservation, managing waste, soil conservation and rotation, and much more. Thanks to the initiatives of the Ministry, Ontario's farmers are learning to be better stewards of the land. The legacy of this program will be reaped by our children.

When I drive to work each morning, I pass the sign on College Road in Guelph that reads "The Future Site of the Ontario Ministry of Agriculture and Food." The bulldozers are not exactly creating much noise pollution these days but I believe that the government's decision to relocate the Ministry at Guelph is a signal of the vital importance of agriculture in the future of this province. The benefits from the relocation will be very exciting - a major stimulus for the economy of Guelph. A dynamic cross-fertilization of work and ideas will result from the close proximity of the ministry and the university, continuing the physical consolidation of our partnership that began in 1874. 1874 was the year Ontario farmers decided they could only survive and prosper if they had access to ongoing agricultural research.

The Ontario School of Agriculture was originally slated to be built in Mimico. Then someone discovered that the 6,000 acres bought there, by the

government, was largely swamp and a new site was purchased in Guelph.

In the last decade, the modern world has discovered that no sector of society can afford to operate in isolation. Government must work directly with industry if its programs are to be effective. Industry must work directly with education if young people are to find productive careers and be prepared to meet the changing needs of the labour market. Reciprocally, industries of all kinds are discovering that the richest load of basic and applied research is to be found in the laboratories of the universities. This cooperative working relationship between government, educators and industries has existed in Ontario's agricultural sector for 114 years and it is more than a working relationship. It is the common dedication of tens of thousands of people who care about the land and its produce.

A man working in the feed industry told me a few weeks ago that farming is a helping industry. Why? Because we recognize we are all in this together. If one sector prospers, we all do and if one sector fails, we all feel the pain. I see that kind of dedication and quality of caring in the provincial agricultural representatives who are spread right across Ontario. I also see it in the professors at the university, who spend their evenings and weekends talking to farmers about new techniques to improve their stock. And, in the concern on the faces of the farmers who come to the university to ask for more information about projected weather trends, the latest research on herbicides, or the impact of bilateral and multilateral trade on the whole industry. A love and respect for the land is a common bond among these individuals and the more I come to understand it, the more proud I am to be in their company.

For an educator, the University of Guelph offers challenges and opportunities that I believe are unequalled anywhere in this country. As I said earlier, the university's roots are deep and strong. It was created to serve farmers and farming. Today, it has an international reputation as a truly unique teaching and research facility for agricultural and food advancement. In the past 20 years, it has stretched and grown beyond its original mandate. It is now seen as one of the best Ontario universities, offering a rich and diverse range of professional programs from agriculture, agricultural sciences, veterinary medicine through to commerce, the arts, the social sciences and the physical sciences. Diversity is, by definition, a source of strength within an academic institution and we will continue to develop in new directions without shedding the genetic form of our past. We will never forget the certificate of our birth nor our commitment to perpetuate its legacy. Our ties to agriculture are yielding both leading-edge scientific research and graduates who are prepared for important and enduring careers.

I wish I had the time to tell you in detail about the dimensions of the research being conducted in our laboratories with the support of both the provincial and federal governments. University of Guelph scientists are making advances that hold enormous promise for Canadian agriculture. Advances in crop science, genetic engineering of livestock, in soil erosion and in meteorology are only a few of the many advances. We receive plaudits from around the world. Last summer, the Ontario Veterinary College announced the creation of a vaccine against shipping fever in cattle. Recently, researchers at OVC announced a successful fertilization of a calf embryo in a test tube. This could lead to the establishment of whole cattle and dairy herds in developing countries, as well as, improving breeding here at home. Another breakthrough, was the filing of a patent, last month, by OAC on a process that will produce 6,000 seeds from a single plant in just 60 days. Think of the potential that patent holds for industry.

Yet, that advance, like all others, could not have happened without the support we have received from the Ontario Ministry of Agriculture and Food, from the federal government, the private sector and the granting councils. As well, the continuing input we get from industry and from working farmers is most important. The bridging between government, education and industry is opening mind-boggling opportunities for development that will benefit all of the players.

Let me give you another example. With our increasing reliance on international markets for the sale of Canadian produce, improved processing is a major priority. The University of Guelph has submitted a proposal for funding under the federal Centres of Excellence program to lead a $7 million research initiative to develop advanced methods of food processing. This program would combine efforts of 35 research scientists in universities across the country, targeting specific research goals, such as process engineering, improved food safety and enhanced food quality. What does it all mean in practical terms? Recently, a researcher at the University of British Columbia came up with a method for controlling the internal gaseous environment in fruits. I think the layman might call that ripening. The Dole Fruit Co. applied the research findings to Canadian raspberries. They sold two million pounds of our raspberries in Seattle and Chicago this summer, six weeks after the fruit had been picked. The marketing life of the fresh fruit was extended by a full four weeks. While the researcher at UBC was completing his work, a researcher on our staff developed a cultivating process that makes it possible to harvest raspberries much later in the growing season. This process could be extended to countless other crops as well.

We are talking about home-grown research applied to home-grown produce, making it possible for us to compete in international markets with a tremendous advantage. If our research proposal for food processing is approved by the federal government, and the prospect is certainly promising, the ongoing work will be overseen by a board of directors that includes the Deputy Ministers of Agriculture from the three provinces generating 90 percent of food

processing in Canada - Ontario, Quebec and Alberta. It is a structurally unique program and a tremendously exciting one. It stands as a model for drawing together the talents of the nation's most brilliant researchers to achieve goals that will bring direct benefits to industry and to the economy. Guelph is also the leading university in a second proposal for funding under the federal centres to research toxicity in the food chain. We are participating in several other joint proposals.

We are moving at blinding speed into an era in which all certainties are becoming uncertainties. An era in which all bets are off. The very economic foundations of society have shifted and are still shifting. No sector has been more vulnerable to those shifts than agriculture. Farming was the prime catalyst of this nation. It was the fertile soil that attracted settlers and those settlers turned Canada into a major food producing country. As our Dean of Agriculture, Freeman McEwen, writes, "From the beginning, the nation's surplus food was exported to generate funds for the building of Canada as a whole." Today, agriculture employs 1.5 million Canadians. More than half of our farmers are forced to turn to jobs off the farm for their primary income.

Agriculture has always been a high risk undertaking with weather, disease and insects posing constant threats for survival. In recent years, fluctuating exchange rates and unstable world markets have seriously compounded the problems. The 1970's were a perilous decade for our farmers. Early projections suggested a growing world demand for food and they borrowed heavily to meet that demand. Then came soaring domestic inflation coupled with agricultural development in China, India, Pakistan and other countries, leaving farmers heavily in debt, and crippled by vast surpluses for which no market could by found. As a result, almost one-third of Canadian farmers are in serious financial difficulty today.

It is in this state that the industry is preparing to meet the perspective challenge of both multilateral and bilateral trade. I will not presume to offer panaceas or to make economic predictions that the informed experts can't agree on. Whether or not bilateral trade with the U.S. takes its current form or some other form, we are no longer trading in a domestic marketplace. We are fighting for a place in the world market. The world market demands unprecedented standards of excellence on the farm, in the food processing plants, in packaging, in advertising and in the opening of new markets. Last week, the Phillip Morris and Kraft; and Nabisco and RGR Reynolds mergers were announced. Food marketing is a multibillion dollar business that is increasingly subject to mergers, as corporate analysts recognize the profit potential in established brands. Capital knows very few geographic boundaries. There is profit to be made but there is fierce competition for that profit. As the Financial Post said, there is a concept that size equals strength and you cannot afford to be a minnow in a world full of sharks. The grocery business is becoming a world affair.

Like it or not, the trade boundaries are coming down everywhere. In 1992, the European Economic Community will become a huge-free market zone, representing the shape of the future for many other markets. It will likely be substantially less fair than it is today. According to Dr. Sylvia Ostrey, Canada's multilateral trade ambassador, the current Uruguay round, in which Canada has played a leading role, is the global policy response to interdependence on the trade front. In effect, at stake in this round is the future of multilateralism. It has often been noted in past negotiations, agriculture was left on the sidelines. In the past, failure to achieve something of significance on agriculture did not doom the rest of the GATT negotiations to failure. But the Uruguay round is different. Agriculture is at its centre and not the periphery. Agriculture is a round breaker or maker. Progress on services or intellectual property, for example, depends on progress in agriculture. In other words, the extension and reinforcement of the GATT itself will have to include meaningful progress in tackling agricultural reform.

The root cause of the problems in agriculture can be captured in two words - subsidy and science. As a consequence of blocking off market signals, producers have continued to increase production of products and a structural surplus. This has led to more non-tariff import protection and export assistance programs.

Finally, the OECD has stressed that rural development, including protection of the environment, is an important policy of all countries. Rural development should be pursued directly and not via policies tied only to agricultural production. There are signs of change. As the Financial Times of London commented in a recent article, the European community is groping slowly towards a new policy for agriculture. Within a few years, it is just possible that the old costly and increasingly discredited common agricultural policy of Europe may be pronounced formally dead. In its place could arise new policies designed to cope, not just with the needs of farmers, but with those of rural areas as a whole.

I am reminded that the Chinese symbol for crisis also translates as the word for opportunity. I know that Ontario's food products have an international reputation for excellence and quality. Government at both the provincial and federal levels is committed to opening new international markets for our products, not only for our agricultural products but all the products this nation makes. Recent marketing initiatives on the Pacific rim have demonstrated there is a potential multimillion dollar market for Ontario produce. The foundations for agricultural research laid down at our university puts us in the international forefront of advances in plant propagation and animal breeding.

As I have said, this is an era in which all bets are off. This is an era in which creativity, ingenuity and an eye for opportunity will yield measureless profit.

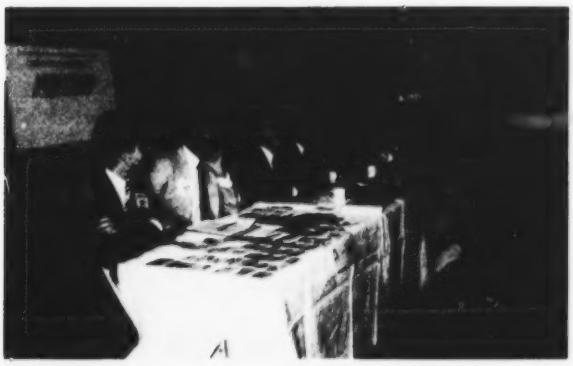
An era in which the spirit of entrepreneurship will be the most valuable commodity, and the spirit of cooperation will be an essential element. I have no doubt that we can meet the challenge and prosper in this brave new world. But, we can only do it by pooling our resources, by sharing our strengths and by stretching for the best of breed in everything we do. Whether we are designing government programs or growing soya beans; whether we are marketing processed foods or searching out new markets; whether we are teaching students doing research or breeding bigger tomatoes; no effort smaller than our very best effort as a province and a nation will suffice. Now, we are in an international war of competition with the rest of the world.

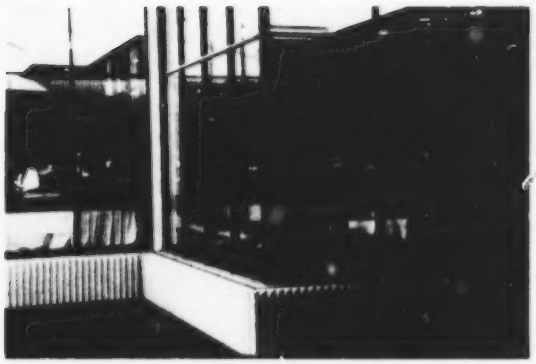
Agriculture is the industry upon which human civilization was built. It is an industry that will endure. The University of Guelph will continue its role in the future to ensure the agri-food industry endures with prosperity and success. As Benjamin Franklin wrote more than 200 years ago, "there are two ways for a nation to become wealthy. It can make war and take the wealth of another nation by force or it can profit through agriculture. For each time a seed is planted, as if by a miracle, new wealth is born."

BIOGRAPHY

BRIAN SEGAL

Brian Segal became President and Vice-Chancellor of the University of Guelph on September 1, 1988. Prior to this he had been President of Ryerson Polytechnical Institute. During the seven years as President of Ryerson, Brian Segal provided strong institutional direction while encouraging program diversity. One of his accomplishments was the implementation of the shift from diploma to degree studies. Brian Segal is the Chairman of the National Innovations Advisory Committee of the Federal Department of Employment and Immigration.





AGRI-FOOD OUTLOOK AND POLICY REVIEW

Prepared by the Economics and Policy Coordination Branch
Ontario Ministry of Agriculture and Food

I. AGRICULTURAL POLICY

UNITED STATES

The 1988 drought has reduced supplies and increased world prices for most agricultural commodities. The U.S. Secretary of Agriculture and the House of Representatives accounted for these conditions when they designed assistance for those hit by the drought.

The Disaster Assistance Act of 1988 was signed into law on August 11, 1988. The bill is estimated to cost between $3.9 and $5.1 billion. The total agricultural budget for 1988 ($55.0 billion) will not increase as a result of the bill. The cost of the drought bill will be offset by savings in government deficiency payments (difference between target prices and loan rates), because commodity prices have risen.

This Act does not signal a shift in U.S. agricultural policy. The thrust of the 1985 Farm Bill remains intact.

The 1989 USDA budget, totalling $46.6 billion, provides funding for these major programs: $16.6 billion for domestic food programs, $12.6 billion for rural development, $11.5 billion for agricultural programs under the Commodity Credit Corporation, and $1.2 billion for international programs.

The farm program provisions for 1989 were greatly influenced by higher commodity prices and lower grain stocks. The Secretary of Agriculture was required by the provisions of the 1985 Farm Bill to lower feedgrain acreage set-aside requirements if ending feedgrain stocks were below 2 billion bushels. Accordingly, the set-aside requirement for feed grains for 1989 was reduced to 10 percent, down from 20 percent, and the wheat set-aside requirement was lowered to 10 percent, down from 27.5 percent.

The paid diversion program has been deleted. Under this program, farmers had the option to divert another 10 percent of their land and these farmers were then eligible to collect a payment on this idled land.

The following table summarizes the price support levels for 1988-89:

	Target Price		Loan Rate	
Commodity	87-88	88-89	87-88	88-89
	- U.S. $/bushel -			
Corn	2.93	2.84	1.77	1.65
Barley	2.51	2.43	1.44	1.34
Oats	1.55	1.50	.90	.85
Wheat	4.23	4.10	2.21	2.06

Future Direction

The 1985 Farm Bill has been successful, according to many American policy analysts. In 1988, the market share of world exports for U.S. agricultural crops has increased over the mid-1980's share, stock levels are no longer burdensome, and the agricultural budget is decreasing. U.S. economists argue that the 1988 drought accelerated the process of achieving these accomplishments, rather than initiating them. Irrespective of the source, Congress is pleased with these achievements. In order to maintain the momentum of obtaining increased market share, changes to loan rates and target prices and set-aside requirements were made to offset the decreased U.S. production in 1988.

As the November 8, 1988 U.S. election draws near, it appears that Vice-President Bush will be elected President. Mr. Bush has indicated that he supports the current policies and his agricultural policy platform offers few new initiatives. Mr. Bush is making statements which deal with the need: to open export markets; to develop new domestic markets; to improve rural economies; and to maintain the federal government as an important source for credit. Mr. Bush does not support Mr. Dukakis' position on supply management.

The 1985 Farm Bill will be in effect till 1990. The next Farm Bill will be developed during the next two years.

EUROPEAN COMMUNITY

Actual spending in 1988-89 on the Common Agricultural Policy will stay within the 27.5 billion ECU limit. The North American drought has also considerably improved the budgetary picture. Higher world soybean prices are expected to save the Community an estimated 150 million ECU. More modest savings are also expected in the cereals sector and a savings of roughly 69 million ECU has already been realized in fruit and vegetable budgets due to smaller than expected harvests. An additional 100 million ECU is anticipated to be saved in this sector by year end.

Notwithstanding the above, the excessive spending needs in other sectors will mean that these savings will be reallocated and spent. The cost of financing the Community's structural surplus in sugar is expected to overshoot budgeted allocations by 200 million ECU. Furthermore, overspending in the sheep meat sector is likely to hit 150 million ECU by year end.

This raises the larger issue of agricultural policy reform and the preoccupation in the Community and other major trading nations with levels of agricultural

support rather than types of support mechanisms. In this regard, the current GATT round has been credited with elevating the debate on issues relating to the production and trade distorting character of domestic agricultural policies. It is widely thought that real agricultural reform will not come in the Community nor elsewhere unless it originates from, and is sustainable by, the multilateral framework of the GATT.

The combination of the many internal growing pains associated with the reorientation of farm policy and the continued pressures for liberalizing global agricultural trade in the GATT will eventually draw the EC away from a purely accounting approach to its agricultural budget. This could happen over the next few years depending on the success of the current GATT round. At that time, the fundamental economics of farm support in the Community will again be the bane, but also the bailiwick, for the EC's agricultural policy debate.

CANADA

Canada-U.S. Free Trade Agreement

Bill C-130, the Canada-United States Free Trade Implementation Act, has moved several steps closer to being passed by the Canadian Parliament. On August 31, 1988, the House of Commons passed an amended version of the legislation by a vote of 177 to 64. Amendments were made to clarify that large-volume exports of Canadian fresh water are not part of the FTA and to remove a clause that would have allowed the FTA legislation to override existing Canadian law. The House of Commons sent the Act to the Senate for its consideration. However, the Senate did not pass the legislation before a federal election was called for November 21.

Whereas ratification of the Agreement in Canada is a major issue in the current election, the United States Congress has passed its implementing legislation. The U.S. ratification process was completed September 28, 1988, when the implementing legislation was signed by President Reagan.

GATT Multilateral Trade Negotiations

It is now over two years since the launching of the eighth round of multilateral trade negotiations (MTN'S) under the General Agreement on Tariffs and Trade. Generally, progress toward achieving the objectives set out for the negotiations at the launch has been steady. The push for a reform of the rules governing agricultural trade in the context of the broad objective to liberalize agricultural trade was strengthened by declarations of support from the Organization for Economic Development and Cooperation in May, the leaders of the Group of Seven at the Economic Summit in Toronto this past June and by the Quadrilateral Trade Ministers at a meeting shortly thereafter.

This past summer however, a sense of impasse developed with the growing intransigence of both the U.S. and the EC. Neither parties appeared willing to move toward a common ground on how to approach the negotiations. While the U.S. has recently voiced some interest in considering the idea of short term commitments, it remains convinced that agreements on longer term goals are essential to the success of the negotiations on agriculture. The EC on the other hand appears to prefer an open-ended format, stressing the need for short-term measures and leaving the longer-term commitments until further on in the negotiations.

The recently tabled Cairns Group proposal was designed in part to stake out the middle ground between the U.S. and EC positions. While the Cairns ideas go far in meeting this objective, it failed to draw the U.S. and the EC away from their initial positions. The recent North American drought has diminished the pressure on governments to address the problems of global agricultural trade. However, while recent higher world prices may have acted to reduce some of the costs associated with farm price and income support, the many underlying problems associated with agricultural trade policies remain.

Still, despite the overall slow movement toward agreement, GATT parties are working diligently at addressing the more technical issues in the agricultural talks. Canada continues to offer its support to the Cairns group in the GATT forum and has contributed to discussions on aggregate measures of domestic subsidies and on technical barriers to trade.

Government Assistance

Compensation to farmers for damage done to their income by the drought this past spring and summer is still being negotiated. The Federal/Provincial Drought Coordinating Committee is reviewing information received from farm groups and will make recommendations to the federal and provincial ministers as soon as crop insurance data is available.

Crop insurance is the preferred long-term vehicle for dealing with crop losses. In Ontario, crop insurance payments will reach $50-$60 million for the current crop year.

On October 19, 1988, Federal Agriculture Minister Donald Mazankowski announced that a further $30 million would be available to assist flue-cured and burley tobacco farmers to exit the industry during the next four year period. Burley tobacco has been grown once (1987) in Ontario since 1984. The federal government also announced that it would be seeking matching funds from the Province. An additional $5 million is being made available to assist tobacco farmers in Quebec, New Brunswick, Nova Scotia and Prince Edward Island.

The Ontario grape growers will receive a federal-provincial compensation package of $100 million. The announcement was made by the federal Minister of Agriculture John Wise, Ontario's Minister of Consumer and Commercial Relations, Bill Wrye, and Ontario's Minister of Agriculture and Food, Jack

Riddell on August 30. The assistance is provided to help grape growers adjust to changing market conditions and to the anticipated impacts of the GATT Panel ruling on provincial mark-up and listing practices.

Details are being worked out by a joint government-grower committee. The broad elements of the 12-year adjustment deal are: an acreage removal program; price supports on selected grape varieties; a surplus removal program; and expenditures on research to improve grape quality to develop new products and to develop new markets.

The federal government's proposed Free Trade Agreement (FTA), if implemented, will equalize U.S. and Canadian wine prices over the next seven years. The Ontario Government has indicated that it will not implement FTA provisions which affect provincial jurisdiction.

On July 21, 1988, Agriculture Minister John Wise announced that the federal government approved the contribution of an additional $400 million to the Farm Credit Corporation as part of FCC's recovery plan to improve its equity position. The equity contribution is the government's further affirmation of its support for FCC and its role as a source of long-term credit to farmers. It is the government's intention to provide further injections of funds over the next three years. These funds, along with FCC's efforts through its recovery program will provide an appropriate capital structure to enable FCC to conduct its affairs on a financially sound basis, as stated by the Minister and in FCC's Annual Report.

ONTARIO

Tripartite stabilization plans have been designed, starting in early 1986, for seven commodities: feeder cattle, slaughter cattle, lambs, hogs, apples, white beans and coloured beans. The red meat tripartite plans have been reviewed to increase provincial participation and to improve the discipline inherent in these plans. Current discussions centre on caps on federal and provincial expenditures by commodity, and a method to allow new provinces to enter. Plans for onions and honey are currently being negotiated.

In Ontario, changing marketing needs and competitive challenges in the beef industry resulted in the formation of an Ontario Beef Marketing Task Force, with representation from all segments of the Ontario beef producing, processing and marketing sector, plus the Ontario government. On October 6, 1988, the results of the Task Force were released. The three main recommendations are:

- The establishment of an Ontario Beef Industry Council;
- Development of a successor program to the Red Meat Program; and
- A vote on whether the industry wants a producer-controlled regulatory agency, with power to set prices based on the cost of production and to set supply, or wants to continue with the current market driven industry. The actual wording of the vote has been left up to Ministry staff and the two beef producer groups.

Jack Riddell, Ontario's Minister of Agriculture and Food, has accepted the report. It is anticipated that many recommendations of the Task Force will be implemented over the next few years.

Both beef producer organizations, the Ontario Beef Producers for Change and the Ontario Cattlemen's Association have endorsed the Task Force Report.

The Agricultural Council of Ontario submitted its report on the quota system in July, 1988. The study was undertaken at the request of the Honourable Jack Riddell to "investigate the quota system in the supply managed commodities and examine current and alternate quota policies ..." The Council's report is now a public document available in English and French.

The Minister of Agriculture and Food has received the report. He has asked the industry for comments before taking any action.

Future initiatives in the Ontario agri-food industry cover several developing issues.

- In the trade area, the Ministry is preparing for the changes as a result of current GATT negotiations and plans by the EC to form one market in 1992. Cooperative work is under way with the University of Guelph to conduct a research and education program with respect to these changes.

- Negotiations are continuing with the federal government and provincial producer groups to establish or strengthen tripartite plans for several commodities.

- Because of changes in the trading environment, the ministry will continue to work with the agri-food industry to improve its ability to compete.

- The Premier's Council Report, entitled Competing in the New Global Economy, has identified the food and beverage processing as a core industry of the province. The value added and the employment generated by this industry form a significant contribution to the province's economy. However, due to a changing trading environment, parts of this industry's ability to compete will be tested. The Ontario government is currently analyzing the competitive ability of the sub-sectors of this industry.

- Following up on its recent initiatives in land stewardship and Food System 2002, the Ministry of the Environment and the Ministry of Agriculture and Food will work together to address long-term quality and environmental concerns.

II. AGRI FOOD OVERVIEW OF ONTARIO

FARM INPUTS

Farm Credit

The Farm Credit Corporation (FCC) forecasts that over the medium term, total farm debt will decrease to about $17 billion, from the high of $22.6 billion in 1985. In 1988-89, the demand for loans from the FCC is not expected to exceed the 1987-88 level. In 1987-88, the total of loans approved under the Farm Credit Act was $206.8 million, down from the 1986-87 total of $336.4 million.

For the second year, the FCC offered commodity-based loans. Under this program, $134.4 million were approved. Of this total, $119.0 million refinanced old FCC loans, and $15.4 million was additional credit.

A report, The $22 Billion Problem: Options for the Financial Restructuring of Farm Debt, released in July 1988 by the House of Commons Standing Committee on Agriculture, states that one in three Canadian farmers is experiencing financial stress because of excessive debt. Under current conditions, farmers owe $5.9 billion in farm debt that cannot be repaid. The billions of government aid dollars during the past few years have been of little help to farmers burdened with more debt than their farms can support. Middle-aged farmers, holding 47 percent of the $5.9 billion debt, seem to be in the most difficulty.

The report suggests that new programs are needed to restructure excess debt and help financially distressed farmers move from agriculture into new enterprises. The report suggests that equity financing for farmers may be the way to restructure farm debt. This view is also supported by the Senate Committee on Agriculture and Forestry report, Financing the Family Farm to the Year 2000, made public in April 1988.

Land

Cash rents paid for cropland in Ontario this past season differed little from those paid in 1987 and 1984, according to a survey conducted by the Economics and Policy Coordination Branch (Cash Rental Rates in Ontario, 1988 by G.A. Fisher). Low returns for corn and soybeans and reduced margins in the processed vegetable crops were the major reasons.

Two areas which differed from the basically no change scenario: Southern Ontario (Oxford to Niagara) rents dropped from $52/acre in 1984 to $41 in 1987 and 1988; rents in Eastern Ontario (from Lennox and Addington east) actually rose, from $12/acre in 1984 to $16 in 1987 and $18/acre in 1988. Selective increases can be expected in 1989, to reflect increased prices for some of the major commodities.

Farmland values across Canada, according to FCC, have fallen by an average 28 percent (adjusted for inflation), since 1982. Farmland which sold in Alberta for an average $829 per acre seven years ago, could be purchased for $387 last year. In Ontario, inflation-adjusted land values plummeted to $1,237 an acre, from $2,342 in 1981. In Atlantic Canada and Quebec, where the farm sector is more diversified and less dependent on grain crops, prices held up somewhat better. (Financial Post)

Land values often correlate to the price of grain, and Ottawa's announcement this summer that the Canadian Wheat Board would pay farmers substantially more than anticipated for grains delivered during the 1988-89 crop year, sent a ripple of optimism through the farm and realty sectors.

Agricultural Chemicals

In Canada, a House of Commons Committee has been studying the proposed changes to Canadian drug labelling regulations under the Food and Drug Act. The Committee has tabled recommendations that would require all food product manufacturers, suppliers, and wholesalers, to provide a list of all food and non-food ingredients in each product and other requirements.

The Ontario government, through a new program - Food Systems 2002 - proposes to decrease the use of pesticides on Ontario crops by 50 percent during the next 15 years. The program involves three main components: research, education and extension. Already four pest management specialists have been hired and plans are near completion for a major producer education effort in 1989.

The regulatory process for pesticides is a sensitive issue. Although the process is subject to intense criticism and scrutiny by consumers, farmers and chemical companies, Agriculture Canada makes the final decision on pesticide registrations. The Department conducts regulatory assessments, and carries out scientific research on agronomic aspects. This has traditionally been an intuitive process.

Recently however, Agriculture Canada has worked to structure and standardize the process to make it more orderly. Initiatives are being taken in response to recommendations received from the Standing Committee on Agriculture. These include changes to more accurately define and characterize key terms such as "acceptability" and "safety, merit and value."

For 1989, increased crop plantings will give rise to an increase in demand and usage of pesticide products. Farmers can expect a marginal increase in prices.

Fertilizer

In the long run, worldwide growth in fertilizer production, consumption, and trade is anticipated over the next several years. By the early 1990's, world growth in nitrogen demand could exceed increases in supplies, leading to higher prices. World supplies of phosphate and potash are expected to be more than adequate. The greatest potash surplus is forecast for North America. Excess phosphate fertilizer supplies

are projected to be in the developed countries.

However, for 1989, the market for fertilizer products is expected to continue strengthening. Increased crop plantings for next year will likely result in a higher demand and higher prices. World stocks of fertilizer are quite low. Several plants have been shut down since 1981 and there appears to be little in the way of expansion. Thus, capacities are limited and the industry could be hard pressed to meet a significant increase in demand.

The Canadian Fertilizer Institute has suggested that world production of potash could increase by 10 to 15 percent, and that prices are expected to rise. Prices for raw phosphate rock and phosphate chemicals are expected to continue the moderate upward trend, a result of an expanding overseas market.

Feed

The dwindling supplies of world grain stocks will ensure that livestock feed prices remain high. Canada is likely to have harvested its smallest grain crop in 13 years in 1988. Barley production is expected to be 30 percent below the 1987 level.

The American Soybean Association has projected that soybean yields could be as much as 40 percent lower than normal. In Ontario, the 1988 production of corn and soybeans, the principal feedgrains, is expected to be significantly lower than in 1987. However, feed manufacturers are likely to use soymeal in the same proportions, despite the dwindling supplies. Trade sources have suggested that only about 10 percent of the soymeal ingredients can be replaced with other sources.

Prices of livestock feeds and commercially prepared feeds are currently significantly higher than they have been for the last two years. In the short term, they are expected to remain at current levels or trend downward slightly. The demand for basic ingredients such as corn and soybeans should soften slightly because of a weak export market to the EC.

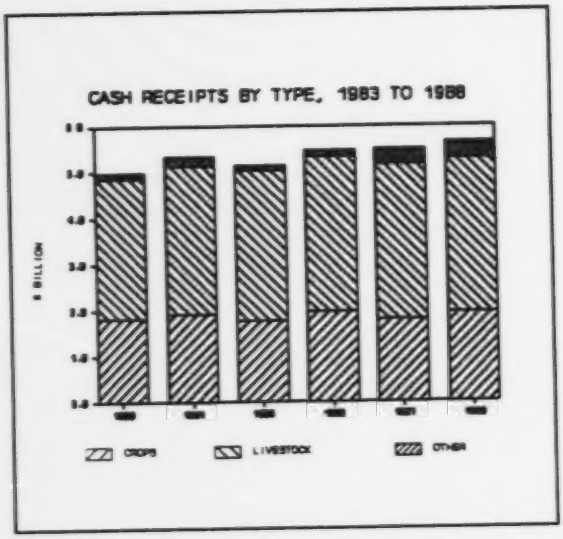
Declining North American output in the hog sector and moderate growth in poultry will prevent any substantial increases in the demand for feeds.

Farm Machinery

Latest data supplied by the Canadian Farm and Industrial Equipment Institute suggests that the summer drought has put a temporary end to the sustained upturn in farm machinery sales that began earlier this year. However, industry analysts are optimistic that farm machinery sales in Canada will continue to improve.

The continuing recovery of the farm economy in both Canada and the United States has prompted major manufacturers to boost production in anticipation of a profitable year. Major factors in the market recovery are aging equipment owned by farmers and the need to replace it, rising prices for used equipment and improved farm incomes.

The recovery is expected to continue into 1989 and the 1990's. During the early and mid 1980's, the industry became increasingly depressed. Capacity and inventories have been reduced to levels in accord with current farm demand. Supplies of used machinery are quite depleted and this market offers little direct competition for new machinery.



FARM INCOME

Revised projections of farm income and operating expenses for 1988 were released by Agriculture Canada in cooperation with Statistics Canada and the provincial Ministries of Agriculture during the summer.

Farm cash receipts for 1988 are projected to be $5.64 billion, an increase of 3 percent from 1987. Gross returns from the sale of crops are expected to be about 9 percent higher. This is due mainly to substantially increased marketings from this year's winter wheat crop and stronger soybean prices. Income from the floriculture industry is also expected to be up sharply this year. Increased grain corn prices are likely to be offset in part by lower marketings resulting from this summer's dry growing conditions.

Fruit and vegetable yields were generally depressed in 1988 due to damage sustained during the extreme drought and high temperature conditions. Early vegetable and strawberry harvests were dramatically reduced. However, improved growing conditions since August have increased yields and quality of late harvested vegetable crops. The apple and grape crops did not make a significant recovery and losses

Net Farm Income from Farming Operations, Ontario, 1984-1987 and 1988 Projection

	1984[r]	1985[r]	1986	1987	1988[p]
			- $'000,000 -		
1. Cash receipts	5,329	5,146	5,455	5,484	5,641
2. Income in kind	70	66	63	60	60
3. Realized gross income (1+2)	5,400	5,212	5,518	5,543	5,701
4. Operating exp. and deprec. charges	4,291	4,246	4,155	4,026	4,258
5. Realized net income (3-4)	1,109	966	1,362	1,517	1,443
6. Value of inventory changes	72	110	(324)	7	n/a
7. Total gross income (3+6)	5,472	5,321	5,193	5,551	n/a
8. Total net income (7-4)	1,181	1,076	1,038	1,525	n/a

[p] Projection.
n/a Not available.
Sources: Statistics Canada (1984-1987) and Agriculture Canada (1988 projection).

are likely to be higher than first anticipated. Peaches were the exception with production estimated to be higher than in 1987. Potato production will be down, but quality is good. It is expected that farm cash receipts from the sale of fruit and vegetables will be somewhat lower than in 1987.

Cash receipts from the sale of livestock and livestock products are forecast to decrease by 1 percent from the 1987 level. Modest increases to income in the dairy and feather sectors are expected to be more than offset by a drop in cash receipts from the sale of hogs (lower prices). Income from the sale of cattle and calves should show little change compared to last year.

Farm operating expenses and depreciation charges for 1988 are forecast to be $4.26 billion, up nearly 6 percent from 1987. After three successive years in which these expenses have shown a decline, the 1988 projection marks the highest level for farm operating expenditures in this province since 1984. The largest increases are likely to be in expenditures on commercial feed (higher prices), machinery repairs, fertilizer (higher prices) and wages to labour. Increased purchases of western feeder cattle could also account for higher farm expenses. Few, if any, expenditure items are expected to show decreases this year.

The realized net farm income of Ontario farm operators (from farming operations) in 1988 is projected to be $1.44 billion. This represents a 5 percent decrease compared to 1987, but is 6 percent higher than in 1986. This figure takes into account the net effect of various program payments made directly to producers, but excludes the value of changes in farm inventories.

For 1989, it is expected that higher commodity receipts will more than offset reduced program payments (in the absence of any additional government assistance measures) such that total cash receipts will continue to rise steadily. Increased average prices for corn, soybeans, floricultural products, cattle, milk and chicken (compared to 1988) are projected for next year. If these are realized, farm cash receipts for Ontario are forecast to increase by approximately 3.5 percent to a level of just over $5.8 billion.

Ontario's farm operating expenses in 1989 are expected to rise at a rate higher than that of gross income. Although increased livestock feed costs will be evident as a result of this year's drought-reduced grain production, operating expenditures will also reflect higher prices expected for a number of farm inputs such as fertilizer, fuel and chemicals as well as higher wage rates. Interest payments should continue to decline as reduced debt load offsets a slight rise in interest rates. There may be some increase in the amount of cash available for investment in capital items such as machinery and equipment. Given this scenario, total operating expenses and depreciation charges for the province in 1989 are projected to increase by about 7 percent.

Assuming a modest increase to the value of income in kind, realized net farm income from farming operations in Ontario next year is forecast to be 9 percent lower compared to the 1988 level.

Long-Term Outlook

Although the theme of this year's conference is "The Next Hundred Years", forecasting what Ontario's farm income will look like in 2088 is beyond the scope of this paper. Nonetheless, a few general remarks can be made with respect to the province's farm income picture in the medium term (the next five to ten years). First, the well-being of Ontario agriculture will depend to a large extent on the strength of the overall economy which is, at present, relatively buoyant. Second, farm cash receipts in the province are likely to continue to rise steadily in the medium term. Higher crop receipts are expected as a result of improved grain and oilseed prices compared to recent years. Prospects in much of the horticulture, floriculture and nursery sectors appear favourable over the course of the next decade.

With respect to livestock, higher gross income is expected in the medium term in the supply-managed industries (dairy, poultry and eggs). Some evidence of growth in the cattle sector (slight increases in breeding herd numbers) points to higher gross

income.

Farm operating expenses and depreciation charges may exceed the general rate of inflation over the next few years, as the costs of some major inputs (such as feed) rise. Although there is some indication that Canadian interest rates will be higher,the effect of this on the total interest on indebtedness paid by producers in the province may be offset by an increased ability to repay existing loans and by decreased borrowings. It is expected that realized net farm incomes will be generally above the average of recent years which may in turn have a modest positive impact on the investment in capital items.

PROCESSING, DISTRIBUTION AND RETAILING

The food processing, distribution, and retailing (PDR) sector currently stands at the threshold of unprecedented change. Domestically, the PDR sector continues to experience increasing competition. New factors however, such as intersectoral competition for consumer food dollars, particulary with the hotel, restaurant and institutional sector (HRI), have begun to play an increasingly important role in the intensification of competition.

In addition, the increasing globalization of trade shows signs of fostering a complete restructuring of the industry. The continued acceleration of mergers, acquisitions, and leveraged buy-outs (LBO's) which transcend national borders are on the increase. The result is fewer numbers of substantially larger multi-billion dollar food companies, with expanded global reach.

Domestically, the PDR sector continues to be driven by changing consumer lifestyles. As more women enter the workforce, and as the number of single parent families increases, the demand for convenience food continues to accelerate. As a result, the take-out food market has become the largest growth area within the food industry. By extension, inter-sectoral competition between the PDR and HRI sector is growing steadily, further fragmenting the former.

The PDR sector continues to respond to this challenge through greater utilization of technology. In-store scanners are generating accurate market research information, while electronically generated coupons are enabling the industry to target specific products (or product categories) to specific customers (or customer categories).

In addition, the technology of computerized shelf space management is enabling retailers to allocate the precise amount of limited and expensive shelf space to specific products or product categories, thereby offsetting the growing marketing power of processors.

The PDR sector has also responded to increased competition by providing greater quantities and varieties of quality, microwaveable, convenience foods. The provision of value-added foods has, by extension, expanded the profit margins of food processing companies, thereby making them targets for mergers, acquisitions and, on occasion, leveraged buy outs.

The Globalization of Trade

Developments in the international arena underscore the dynamics and vitality of the PDR sector, and the growing impact of the globalization of trade.

The vitality of the PDR sector is underscored by the ongoing LBO attempt for RJR Nabisco, which if successful, will be the largest corporate transaction in history. This dynamism is reinforced by additional ongoing acquisition attempts, such as those of Kraft, Pillsbury and Tyson Foods. The size of these transactions, which were once thought impossible, appears now to be the beginning of a trend toward global consolidation. As multi-billion dollar firms expand in size and reach, their marketing power will come to dominate domestic markets. Conversely, the spin-off of less profitable lines, or entire segments of these firms will create new opportunities for additional, albeit smaller scale acquisitions. Niche markets for smaller food processing firms will continue to appear as consumers demand specialized, quality products.

In addition, the PDR sector continues to prepare for adjustments, if not actually implementing adjustments, in light of anticipated changes in the international environment. The ongoing multilateral trade negotiations will inevitably become a growing influence upon the PDR sector. In the meantime, firms are beginning to position themselves strategically in preparation of the creation of a European free-market zone in 1992. To this end, Toronto-based Lawson Marden Group has already merged three plastic bottling operations with the rival Metal Box Group in Britain. This move is ultimately designed as a springboard to expansion into continental Europe.

Of all the prevailing international developments, however, the anticipated January 1, 1989 implementation of the Canada-U.S. Free Trade Agreement has generated the greatest impact thus far upon the Canadian PDR sector. The exact nature and extent of the impact of the FTA remain uncertain at this time. The expected increased flow of U.S. products into the Canadian market will inevitably contribute to further increases in the level of domestic competition. This in turn will create greater pressures at the producer level. Conversely, niche markets for specialized quality products may be created as the major players concentrate on promoting established product lines to an expanded market. The creation of a liberalized trade environment will additionally contribute to enhancing the impact currently exhibited by the underlying factors of influence characteristic to the domestic sector.

Conclusion

The PDR industry, which is characterized by its dynamics and speed of evolution, is currently on the threshold of unparalleled change. Domestic factors, such as changing demographics and lifestyle trends will continue to foster increased competition and the sectoral adjustments which accompany increased competition. The dawning of a liberalized Canada-U.S. trade environment, the ongoing multilateral trade negotiations and the creation of a European free market zone, will undoubtedly add to these factors.

In the years ahead, information, obtained through the increased use of technological innovation, will become the cornerstone in the ability of a food and beverage processing company to respond to the changing market realities, and thus in the ability to maintain the all-important competitive edge.

III. FIELD CROPS

WORLD OVERVIEW

The USDA estimates for the world supply and demand situation of field crops reflects the impact of the 1988 North American drought on the world supplies, especially corn and soybean supplies.

Wheat

World production of winter, spring and durum wheats was estimated to increase very slightly in the 1988-89 crop year to 505 Mt. Concern, however, is with the ending stock figure. The 1988-89 ending stocks will decline to 114 Mt. This stock level is 21 percent of utilization.

Coarse Grains

Coarse grain (includes corn, sorghum, barley, oats, rye, milled rice, and mixed grains) will see an even more dramatic decrease in ending stock. The USDA estimates an ending stock of 115 Mt. in 1988-89 compared to the 1987-88 estimate of 209 Mt. This is a 45 percent decrease. The distressed U.S. crops are reflected in the world coarse grain crop, estimated to be 709 Mt.

The USDA estimates world corn production of 382 Mt. in 1988-89 compared to the 1987-88 estimate of 445 Mt. The world ending stock for corn is estimated at 65 Mt. These figures translate into a decrease in the corn ending stock of 55 percent.

Oilseeds

Soybean production is estimated at 94 Mt. in 1988-89. The world ending stock for soybeans will be down by 33 percent to 112.8 Mt. Soybean meal and oil will have ending stocks of 3.1 Mt. and 1.9 Mt., respectively.

World oilseed production will only experience a 2 percent decline in production in 1988-89. The USDA estimates world oilseed production at 200.9 Mt. in 1988-89, compared to 205.7 Mt. in 1987-88.

UNITED STATES

Wheat

The wheat crop will be the smallest experienced in 10 years. The USDA estimated the total wheat crop to be 1,812,095,000 bushels for 1988-89.

The ending stock for all wheats are down dramatically. The 1988-89 ending stock has been estimated at 528 million bushels compared to the beginning stock figure of 1,256 million bushels.

Coarse Grains

The corn crop is estimated to be 4.55 billion bushels or 36 percent lower than the 1987 crop of 7.0 billion bushels. The national average yield has been estimated at 80.2 bushels per acre compared to the 1987 average yield of 119.4 bushels per acre.

The ending stock for corn for 1988-89 is estimated at 1,407 million bushels. This compares to the beginning stock in 1988-89 of 4,260 million bushels.

Oilseeds

The soybean crop will be 22 percent lower than the 1987 crop. The October estimate indicates that there will be a crop of 1.5 billion bushels. The soybean yield will be 26.4 bushels per acre according to the USDA. This figure compares to the national yield average of 33.7 bushels per acre in 1987.

The production estimate for soybeans translates into an ending stock figure of 125 million bushels for 1988-89. The 1988-89 beginning stock was estimated to be 302 million bushels.

CANADA

Canadian grain and oilseed production in 1988 are down significantly, but not throughout the country. While most of Western Canada was severely affected by the drought, grain production in Quebec and the Maritimes increased.

Wheat

The Statistics Canada September Principal Field Crop Report estimates a 1988 crop of 12.3 Mt. This is a 41 percent decrease over the 1987 production of 20.7 Mt. of spring wheat. Durum production suffered an even greater decrease. The 1988 estimate is 2.0 Mt. compared to the 1987 estimate of 4.0 Mt.

The 1988 winter wheat production estimate shows an increase over the 1987 estimate. Although each of the prairie provinces experienced a decrease in the production, mostly due to reduced acreage but also reduced yields, Ontario's production increased by 190 percent resulted in a slight national increase to 1,236,700 tonnes compared to 1,216,200 in 1987.

Coarse Grains

Canadian spring grain production has also suffered from the dry conditions. Statistics Canada estimates barley production to be 10.0 Mt. and oats to be 2.9 Mt. This compares to the 1987 estimates of 14.0 Mt. and 3.0 Mt. for barley and oats, respectively.

ONTARIO

The 1987-88 crop year will not only be remembered as the year in which crop production suffered, but it will also be a year of surprise at the resiliency of the crops grown in Ontario despite the extremes of weather.

Wheat

Winter wheat is one of the crops which has surprised many. Incredibly, the Ontario winter wheat crop will yield 920,000 tonnes according to Statistics Canada. Not only were the production estimates too pessimistic, the discussion on the quality was also erroneous. Contrary to early predictions of poor quality, the 1988 winter wheat crop is of excellent quality.

Coarse Grains

Statistics Canada estimates an Ontario corn for grain crop of 3.6 Mt. This compares to the 1987 production of 5.5 Mt. This is a 35 percent decrease from 1987 to 1988. The 1988 decrease compared to the 5-year average is 30 percent. With respect to yields, Statistics Canada is estimating an 1988 Ontario average yield of 5.1 tonnes per hectare or 80.5 bushels per acre. Industry estimates in June were between 4.1 and 4.7 tonnes per hectare (65 and 75 bushels per acre). This compares to the record breaking 1987 yield of 7.33 tonnes per hectare (117 bushels per acre). The decreased 1988 yield is not as dramatic when compared to the 5-year average of 6.4 tonnes per hectare (102 bushels per acre).

Quarterly Farm Price Outlook

Commodity	88:IV	89:I	89:II	89:III
		- $/tonne -		
Grain Corn	140-150	145-155	140-150	120-130
Barley	140-145	140-145	135-140	120-130
Soybeans	305-315	310-320	310-330	300-320

Corn and Soybean prices are basis Chatham.
Source: Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food.

Both barley and oats also experienced decreases in yields in 1988 over 1987. Barley yielded 2.51 tonnes per hectare (46.5 bu./acre) and oats yielded 1.77 tonnes per hectare (46.3 bu./acre) according to the September Statistics Canada report.

Oilseeds

Soybean production will be down by 13 percent in 1988 over 1987 according to Statistics Canada. The average Ontario yield per hectare will be down 0.66 tonnes per hectare to 2.1 tonnes per hectare. The 5-year average yield is 2.4 tonnes per hectare.

Canola is one of the few crops which experienced an increase in production in Ontario in 1988. The main reason, however, is the increased acreage from 16,200 hectares in 1987 to 26,300 hectares in 1988. The average yield for canola is reported to be 1.29 tonnes per hectare (23.1 bushels per acre). This compares to the 1987 yield of 1.82 tonnes per hectare or 32.5 bushels per acre.

Tobacco

An estimated 110 million pounds of flue-cured tobacco was grown in 1988, which when added to the estimated 25 million pounds farm carryover from previous years, would provide about 135 million pounds for this year's auction. The industry's marketing target for 1988 was 141.2 million pounds. The short crop can be attributed to both dry weather and below-average plantings.

Ontario tobacco auctions opened on October 17, 1988 and it is too early to determine any trends. World tobacco stocks are down and demand is expected to be good.

OUTLOOK

Although the drought of 1988 was experienced mostly in North America, the major grain and oilseed producing countries will be adjusting their production intentions. Brazilian estimates indicate that there could be a 24 percent increase in soybean production in the centre-south region of Brazil. The Brazilian Agriculture Ministry has estimated a production of between 21.4 million and 22.1 Mt. for 1988-89. The 1987-88 production was estimated at 17.8 Mt. The Ministry predicts that there will be a 9 to 13 percent increase in planted area.

These figures are the first of many which will confirm that producers worldwide are and will be increasing their planting intensions now and in the spring of 1989.

Some analysts are suggesting that the changes to the planting requirements introduced in the U.S. Disaster Assistance Act of 1988 and the annual set-aside requirement announcement will result in an estimated 10 million acre increase in corn plantings in the U.S. This estimate means that there could be 77 million acres of corn grown in the United States in 1989. USDA estimates that 73 million acres of corn will be planted in 1989. This would translate into approximately an 8 billion bushel harvest, an increase of 43 percent over this year's crop of 4.5 billion bushels grown on 67.5 million acres.

Soybean acreage for 1989 in the U.S. is predicted to be 60 to 62 million acres. This area compares with USDA's 1987 estimate of 58.0 million acres

and its 1988 estimate of 58.8 million acres. Based on normal yields, a 61 million acre crop would yield 2 billion bushels, an increase of 33 percent over this year's crop.

The poor spring wheat production in the U.S. due to the drought and the reduction in the wheat set-aside from 27.5 percent to 10 percent of base acreage will result in increased wheat plantings in 1989. The acreage for all wheats will increase to approximately 75 million acres. This is a 10 million acre increase over the 1987-88 USDA estimate of 65.7 million acres.

It appears that the U.S. Export Enhancement Program (EEP) policy will be maintained indefinitely. Both Presidential candidates support the program. Therefore, the EEP will continue to provide a marketing opportunity for U.S. wheat.

The Soviet Union will continue to attempt to improve its production capability. The argument that the U.S.S.R. will never be able to achieve self-sufficiency due to the climate and policy appear to underestimate the leadership's mandate to increase the standard of living for its people.

The Soviet leadership has adopted far-reaching measures to change the economic system of the USSR from state ownership to privatization. Within agriculture it is expected to result in moving the responsibility and decision-making for production and marketing down to the farm level. Such action will likely result in less wastage and higher production. However, since private enterprise on a commercial basis has not been practised by those currently farming, an educational program will be required to fully utilize the proposed changes.

Canadian producers of field crops will also be adjusting their plantings in fall 1988 and spring 1989. The adjustments, however, will not be as dramatic as the increases that will be experienced in the U.S. Neither western Canada nor eastern Canada have large tracts of fallowed land. Production, however, will increase as higher prices will encourage producers to use increased levels of inputs and increased yields will be achieved (higher than pre-drought levels).

In eastern Canada, there will be a shift in production rather than an increase in hectares planted. In recent years, the corn area has been declining. Producers in 1989 may reverse that trend. Diversified cropping operations will be adjusting their plantings based on potential returns. Both supply and demand pressures will be reflected in prices offered during the months leading up to spring planting. The price forecasts found in the table below reflect increased corn production in Ontario but more importantly, increased production in the U.S. The Chatham corn prices are forecast to be between $120/tonne and $155/tonne. The wide range takes into account strong current prices and stronger prices in the first quarter of 1989, but corn prices will decline as planting intentions and weather conditions become known.

In the longer run, the success or failure of GATT negotiations will direct field crop production in Ontario. If negotiations succeed, Ontario producers will need to ensure that all of their crops are produced efficiently and that their crops are a quality product. This will be necessary in order to compete globally. Among other things, this will require increased investment in new technology.

A failure of the GATT negotiations to reduce tariff and non-tariff barriers will also result in changing to efficient production practices. Although governments will be permitted to maintain assistance programs, government budgetary constraints will restrict government expenditures in agriculture. This implies that producers will need to ensure that their returns are maximized as *ad hoc* government payments are reduced.

IV. LIVESTOCK AND POULTRY

OVERVIEW

Last summer's drought in North America has had an impact also on livestock and poultry and will continue to affect these sectors for at least until prospects for the 1989 grain crops become evident. The direct impact of the drought on livestock and poultry production from higher mortality and reduced rates of gain has been generally of limited significance. The major impact has been in terms of increased cost of production and lower profitability of livestock and poultry enterprises as a result of a sharp rise in feedgrain prices.

In Ontario and Canada the fed cattle segment suffered a sharp price decline in the expectation that marketings would be higher than previously anticipated and profits in beef feeding would fall. In turn, this led to lower feeder cattle prices.

The hog sector has continued to be influenced largely by cyclical factors with significant increases in slaughterings, both in Canada and the United States, resulting in depressed prices. This, coupled with increased cost of production has put a squeeze on profit margins.

Also the poultry sector in Canada, despite the supply management shield, has been caught in a cost-price squeeze, although with less severe consequences. In the case of chicken, a strong seasonal demand and reduced production pushed prices to profitable levels in the summer, but the situation has deteriorated recently. This sector faces uncertain prospects for the remainder of 1988 and the first part of 1989. For the turkey sector, ample supplies throughout 1988 have kept prices in check and have affected returns to producers and processors. This situation will lead to caution in setting 1989 production quota levels and will likely result in consolidation rather than expansion in 1989 for both the chicken and turkey industry.

For the longer term, trends which have emerged in the past several years in the red meat and poultry sectors are likely to continue in the next decade. Projections for the next 10 years by a reputable U.S. source (FAPRI, Iowa State University) provide the following indications for the United States:

- Total beef production and consumption would remain relatively flat, with a tendency to decline slightly. Forecasted per capita consumption shows a slow but steady decline from 76 pounds in 1987 to 66 pounds in 1997;

- The hog industry will be characterized by the traditional cyclical patterns in production and consumption, with no definite trend. Per capita consumption is also influenced by cycles, but shows a slowly declining trend.

- The chicken sector shows a definite upward trend in both production and consumption. Per capita consumption is projected to increase from 59.7 pounds in 1987 to 66.8 pounds in 1997.

- For turkey, it is expected that after the rapid expansion of the past few years, production and consumption will level off or grow at a slow pace, with per capita consumption rising by only one pound through the 10 year period.

In summary, the shift in consumption from red meats to poultry meats will continue through the next decade. The overall supply of meats will remain abundant and will restrain price increases.

The general trends indicated by the above projections can be considered applicable also to Canada, although the magnitude and pace of the trends may differ.

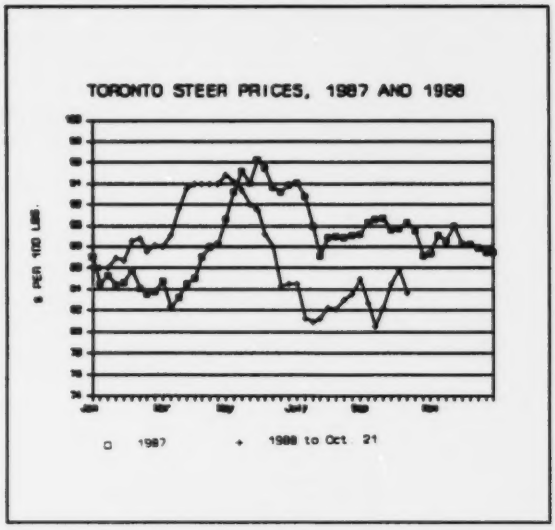
Farm Price Outlook for Livestock, 1988:IV to 1989:III

Commodity	88:IV	89:I	89:II	89:III
A1, 2 Steers ($/cwt.)	81-86	86-92	88-93	89-94
Index 100 Hogs ($/cwt.)	57-59	60-64	64-68	68-73
Index 100 Hogs ($/100 kg)	125-130	133-140	140-150	150-160
Chicken ($/kg)	1.15	1.15	1.18	1.22
Turkey ($/kg)	1.52	1.50	1.48	1.48
Eggs ($/doz)	1.11	1.10	1.09	1.07
		- $/hectolitre -		
Fluid Milk	54.51	54.51	54-57	54-57
Ind. Milk Target Support	47.06	47.06	47.06	47-49

Source: Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food.

BEEF CATTLE

Ontario cattle prices have taken a roller-coaster run during 1988. After gathering momentum in 1987, Toronto A1,2 steer prices moved from an average of $86.27/cwt. in January 1988 to a peak of $94.13/cwt. in May 1988. After May, news of a drought in Canada and the U.S. caused feed prices to rise, expected profits in the beef cattle industry to fall and marketings to be higher than previously anticipated. This sequence of events precipitated lower cattle prices. For the third quarter of 1988, Toronto Al, 2 steer prices averaged $82.62/cwt. as



compared with $90.06/cwt. for the same period in 1987. As a result, tripartite stabilization payments will be paid to participating producers at the following rates: slaughter cattle, $8.67/cwt. ($100.95/head); feeder cattle, $4.10/cwt. (32.79/head).

The severe drop in slaughter cattle prices has triggered lower feeder cattle prices. As a result, further expansion in the cow-calf herd throughout Ontario and, in fact, throughout North America has been postponed.

The reduction in cattle slaughtered in Canada has not had an equivalent impact on beef output. Carcass weights rose from an average of 637.6 lbs. in the first three quarters of 1987 to 655.8 lbs. for the same period in 1988. This rise has caused Canadian beef output to fall only 1.4 percent while cattle slaughtered was down 4.2 percent. Similarly, lower cattle slaughterings in the U.S. have not caused beef output to fall. In fact, cumulative beef output for the January to September 1988 period reached 17,652 million lbs., up from 17,555 million lbs. for 1987.

With the 1988 beef output across Canada and the U.S. almost equal to 1987 levels and beef consumption flat, U.S. cold storage beef stocks have increased. As of October 1, 1988, U.S. beef cold storage stocks were 306.0 million lbs., up 6.8 percent from last year. Total meat supplies have also increased, causing beef to face growing competition at the retail level.

The supply of beef in the Canadian market has been moderated by beef exports exceeding imports. Between January and September 10, 1988, Canadian beef exports reached 101 million lbs. as compared with imports of 85 million lbs. However, recently reputed errors in Canadian beef import figures may

cause this picture to change when the data are revised.

World beef trade was altered this year through the U.S.-Japan agreement on beef imports. The agreement, reached in the summer, resulted in a plan to increase Japanese beef import quota by 60,000 tonnes annually over three years. Beef import quotas were originally set at 194,138 tonnes for the period April 1, 1987 to March 31, 1988. A similar agreement was signed between Japan and Australia.

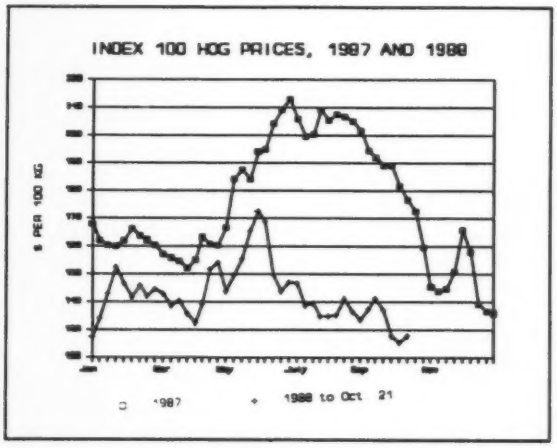
The relaxation of the Japanese import quotas has caused increased competition and tension between U.S. and Australian suppliers to this lucrative market.

The changes occurring in the international and domestic beef markets will have a significant impact on the outlook for the Ontario beef industry. Higher feed costs will continue to reduce the profitability of the beef industry. However, if the 1989-90 feedgrain production return to normal, the cattle market will turn around very quickly. The low cattle inventories throughout North America have already put a floor under cattle prices. Toronto A1,2 steer prices are expected to average between $84.00 and $92.00/cwt. for the next four quarters.

HOGS

Ontario hog prices have continued to decline after gaining strength seasonably during the summer. The Ontario Index 100 hog prices for September 1988 was $137/100 kg compared with $193/100 kg the previous year and $160/100 kg in June. These reduced price levels have triggered a payment to producers under the National Tripartite Stabilization Plan. For the third quarter of 1988, the payment is $30.01/100 kg or $23.53/head.

The drop in hog prices has been caused by increased hog slaughterings in Canada and the U.S. In Canada, federally and provincially inspected hog slaughter reached 11.2 million head, for the period ending October 1, 1988, up 5.4 percent from last year.



The high supplies of pork in the U.S. market and low hog prices have prompted the U.S. National Pork Producers Council to again become concerned about Canadian hog and pork imports.

Meanwhile, the U.S. Commerce Department has been engaged in an administrative review of the countervailing duties on U.S. imports of Canadian live swine. In a preliminary determination, the Commerce Department reassessed the duty at 2.2 cents per pound from the previous 4.39 cents per pound. This change was aimed at reflecting lower levels of Canadian government subsidies during the review period. A final ruling is expected later this year.

With increased pork supplies and flat consumer demand, the U.S. pork producers have voted to continue the National Pork Check-off program. The check-off is equal to one-quarter of 1 percent of the market value of all hogs and pigs sold in the U.S. and an equivalent amount on all imported hogs, pigs, pork and pork products. Funds from the check-off will be used to fund product promotion and research in the hog and pork industry.

The outlook for Canadian hog prices remains unappealing. The high hog inventories and large pork stocks will continue to put downward pressure on hog prices. The potential lower beef supplies in 1989 could provide some support for the hog industry, but this support will likely be weak. As a result, Ontario Index 100 hog prices are expected to average between $127/100 kg to $145/100 kg for the next four quarters.

DAIRY

World

For 1987 world milk supplies increased by 0.7 percent relative to 1986. Production in the EC declined by 5 percent, reflecting a reduction in the amount of quota in the system. United States milk production declined by 0.6 percent as the result of the U.S. Dairy Termination Program reducing cow numbers. For 1988, U.S. milk production is expected to be 1.0 percent higher compared to 1987. Small increases in total world milk supplies are expected to occur in 1988 and 1989. Intervention stocks have declined significantly in the last two years, causing GATT minimum prices to be increased on four occasions.

The world price for skim milk powder has a significant effect on the incomes of both Canadian and Ontario milk producers. This is the case since the structural surplus of skim milk powder produced within the national industrial milk marketing plan must be exported at a loss onto the world market. This loss is the responsibility of Canadian industrial milk producers which is covered through the collection of an in-quota levy. The world price for skim milk powder has increased from U.S.$700 to $1,800 per tonne in the last two years, thereby reducing the Canadian producers' in-quota levy.

Canada

During the 1987-88 dairy year (August 1, 1987 to July 31, 1988) Canadian domestic requirements for industrial milk increased by 1.3 percent to 45.9 million hectolitres. Ontario producers utilized 102.3 percent of Ontario's market share quota allotment during the 1987-88 dairy year. Ontario's fluid milk consumption is predicted to increase by 1-2 percent for the 1988 calendar year.

During 1987, the Canadian Milk Supply Management Committee established a study team to make recommendations with respect to the national plan for industrial milk. The Honourable Jack Riddell addressed the study team during its visit to Toronto in February 1988. The study team is putting together a package of proposals to improve the flexibility of the plan, including ways in which industrial milk quota is allocated between provinces. The province of British Columbia has serious concerns regarding their industrial quota allocation relative to their population base. Currently the study team is continuing discussions in working towards a package of proposals.

Ontario

During 1988 an agreement was reached between the Ontario Milk Marketing Board and the Ontario Cream Producers' Marketing Board regarding a cream to milk conversion program. This five-year program commenced August 1, 1988 with approximately 100 cream producers converting their cream market share quota to milk market share quota.

On May 1, 1988 the Ontario Milk Marketing Board (OMMB) increased the price for Class 1 milk (beverage milk) by $2.00 per hectolitre. The OMMB uses a fluid milk formula as a guide in making decisions with respect to the price for Class 1 milk. Current formula projections make it unlikely the OMMB would increase the price for Class 1 milk until the second half of 1989. Similarly, it is unlikely there would be a change in the industrial milk price before August 1, 1989.

CHICKEN

Situation

So far, 1988 has been a year of mixed performance for the chicken industry. The year started with large supplies which continued for several months and depressed the prices and returns for both producers and processors. Then, in late spring and through the summer, the market showed an upsurge brought about by stronger demand and tight supplies, largely related to weather factors. Wholesale prices rose throughout the summer to peak at $2.57/kg in the week of September 10, from $2.10 at the end of June. This, however, was accompanied by missed marketing opportunities. Production in periods III and IV has been below allocation by some 9.5 Mkg, while supplementary import permits for 2.04 Mkg of chicken were issued, mostly to Ontario firms.

Due to disruptions in placements caused by the heat wave, bunching of marketings has occurred in October, in coincidence with traditionally reduced demand for chicken for Thanksgiving. In recent weeks, wholesale prices in Ontario have plunged rapidly to $1.94/kg in the week of October 15, and producer prices fell to $1.15/kg (which is about 8 cents/kg below the COP), from the peak of $1.25/kg in September.

Outlook

An improvement in the chicken market, expected by the beginning of November as the production should start to decline, based on a very conservative quota for period V (Oct. 16 to Dec. 31) may not materialize. There is much concern that quota not utilized in previous periods may be produced in this period. Doubts persist as to whether wholesale prices through period V can be increased sufficiently to allow processors to pay live prices which would cover or approximate the cost of production. Yet, because of underproduction in periods III and IV, the targeted annual disappearance of 571.2 Mkg will not be reached.

For 1989 the level of disappearance for Canada has been projected by the CCMA at 578 Mkg, an increase of 1.2 percent over 1988 (preliminary) which would be taken up by the increase in the global import quota from 6.3 to 7.5 percent, (if the FTA will be implemented in 1989), while the preliminary domestic quota would be unchanged from the 1988 level of 538 Mkg. For period I of 1989 (Jan. 1 to March 18) the level of disappearance has been set at 115.0 Mkg and the level of production at 107.2 Mkg. This disappearance is 3.8 percent less than in period I of 1988, and the production is 2 percent less. For period II (March 19 to May 27) the level of disappearance has been set at 111.0 Mkg and that of production at 103.2 Mkg, both within 0.5 percent of last year's actual levels. This reflects the concern for high feed costs and the need to allow chicken prices to rise at all levels to ensure more adequate returns to producers and processors.

Caution not to create situations of oversupply (which could prove very costly given the persisting high feed prices) will be a dominant consideration in setting quota levels through 1989 and the quota which will be actually produced. The year 1989, therefore, is likely to be one of consolidation rather than expansion, after several years of substantial growth. For the longer run, however, industry growth prospects remain favourable.

The Ontario Chicken Marketing Board has recently announced revisions in its quota policy to become effective January 1, 1989. The most significant change is that the Board will permit the transfer of quota rights separately from premises, subject to maximum and minimum quota levels that can be transferred or held. This is of particular interest for

new entrants as it provides them with the opportunity to enter the chicken industry without having to purchase the premises together with the quota. Other significant aspects are that Class 3 quota will be converted to basic quota on January 1, 1989 and the Board will permit relocation of quotas, with each case being considered on its own merits.

TURKEY

Situation

Turkey production in the first eight months of 1988 was 10 percent higher than in the previous year. Disappearance in the same period showed a healthy growth with an increase of 11 percent. Despite such a favourable rate of consumption, an ample supply situation has prevailed throughout the year (especially for toms) and is still persisting. On September 1, 1988, storage stocks were 13.5 percent higher than in the previous year and at a record level.

Returns of both producers and processors have been affected by abundant supplies. Although producer prices have improved, the rate of increase has been lower than that for the cost of production. Processors had to reduce prices, especially for toms, in order to move products into consumption and prevent further accumulation of stocks.

Outlook

Based on placements, indications are that production in period III (Sept.-Dec.) would be higher than that of the same period in 1987, and the total 1988 production would exceed the quota. Considering the higher stocks at the beginning of the period and the larger global import quota still available (and likely to be used up in period III), total supplies in Sept.-Dec. could be burdensome, and year end inventories substantially higher than previous year.

The preliminary quota for 1989 is still at 114.4 Mkg, the same as the final 1988 quota. On account of the possibility of high year end inventories and the difficulty for producers to recover the full cost of production, there is broad consensus within the Canadian Turkey Marketing Agency (CTMA) for exercising caution and eventually adjusting downward the 1989 final quota. A decision on this matter has been postponed to the next meeting of the CTMA in late November when the supply-demand prospects for the end of 1988 and for 1989 can be assessed more accurately.

The turkey industry in Canada has shown a significant growth in production and disappearance for four consecutive years. Despite a possible slow down or a pause in 1989, opportunities exist for sustained growth in the longer term. The growth of the foodservice sector, the expansion of sales for fresh turkey, both in carcass and cut-up forms, the trend to greater use of the microwave oven, the introduction of new turkey products and increasing activities in further processing offer definite potential and opportunities for development of the industry in Canada. There is still a long way to go to match the degree of development that has taken place in the turkey industry in the United States.

EGGS

To the end of September 1988, domestic egg production was slightly higher than previous year, while imports were lower. Table egg disappearance was down by 1.6 percent, contributing to an increase of 13 percent in total surpluses. The processors' demand, however, increased by about 20 percent, resulting in total demand being virtually the same as the previous year. The above pattern can be expected to continue to year end, with minor changes.

In the past few years the supply-demand relationship in the egg sector has been characterized by a slow but steady increase in domestic egg production, largely related to rising rates of lay, and a downward trend in table egg consumption. The end result has been an increasing level of surpluses and a rise in the cost of the surplus removal program, particularly for the portion that has to be disposed of in the export market. CEMA faces a debt of close to $10 million by the end of 1988.

Corrective measures had to be taken, including a quota cutback of 2 percent effective January 1, 1989. The application of updated figures for unregulated flocks in conjunction with the quota cut will result in a substantial variation from province to province in the quota change for regulated producers. A shift in production from Central Canada to Western Canada will occur. In Ontario the quota cutback will be 3.22 percent, which will aggravate the recurring shortages of Grade A large eggs in this province. The Canadian egg production in 1989 is expected to actually decline by 1.5 percent from the 1988 level.

Producer prices for Grade A large eggs in Ontario rose from $0.96/dozen at the beginning of this year to $1.11/dozen in October, due mostly to increases in feed costs. Prices are expected to remain close to the current level for the first half of 1989. There is concern that such price level will be reflected in retail prices and will also affect table egg disappearance in 1989.

V. HORTICULTURE

UNITED STATES

Fruit

The 1988 **U.S. apple crop**, estimated at 8.07 billion pounds, is down 23 percent from last year's record, but 2 percent above the 1986 crop. New York State expects a crop of 790 million pounds, off 10 percent from a year ago. Michigan expects to harvest 700 million pounds, down 33 percent from last year's record, but remaining unchanged from 1986. Washington, the nation's leading apple-producing State, expects a crop of 3.2 billion pounds, off 33

percent from 1987's record crop.

Because of last year's record crop, the 1987 season-average price for all apples received by growers was 8.5 cents per pound, down 37 percent from 1986. The seasonally-reduced supplies early this summer strengthened grower prices for fresh apples. The August price, 26.1 cents per pound, was 63 percent above a year ago. Domestic demand for fresh market apples is likely to remain relatively strong because of substantially reduced supplies of winter pears during this fall and winter.

Processor demand for this year's apple crop may still remain relatively strong, even though supplies will be reduced and prices are higher. Consumer demand for apple juice will remain constant in anticipation of continuing high orange juice prices.

The 1988 **U.S. grape crop** is expected to be 5 percent above both the 1986 and 1987 crops at 5.51 million tons. The increase is primarily attributed to expanded California production. Prices for fresh grapes have remained relatively strong, and demand is likely to be strong in view of the healthy economy. Wine imports are likely to remain sluggish because of higher prices resulting from the weak dollar. U.S. wine exports continue to improve. Canada and Japan remain the two leading foreign markets for U.S. wine, up 39 and 102 percent, respectively, from last year.

The 1988 **U.S. peach crop** is forecast at 2.53 billion pounds, up 4 percent from 1987. The 1988 **U.S. pear crop** is forecast at 818,100 short tons, down 13 percent from last year's record crop. The plum crop in California is up 2 percent from last year's large crop, and prune and plum production in Idaho, Michigan, Oregon, and Washington is expected to be 7 percent less than 1987.

Smaller crops of apricots, clingstone peaches, bartlett pears, and apples, probably will result in less canning than last year. The depleted carryover stocks and the reduced pack will keep most canned fruit supplies tight this season. Prices for canned fruit are expected to remain strong throughout 1988-89.

Most frozen berries in cold storage are moderately to significantly smaller than one year ago. Thus, lower supplies, higher raw fruit prices, and stable demand are likely to keep most frozen berry and fruit prices strong.

Vegetables

Harvested acreage of all fresh market vegetables (including honeydews, but excluding onions) is expected to be up about 2 percent, based on increased winter, spring, and summer acreages and a slight increase in fall acreage.

The 1988 drought has had its greatest impact on snap beans, sweet corn, and green peas for processing in the mid-western States. Most of these states' vegetable acreage is devoted to canning. The 1988 prospective canning acreage as of July 1 fell short of last year's plantings. Harvested area and preliminary output estimates indicate even further reductions.

Harvested area for all onions is expected to reach 126,700 acres in 1988, which is more than 2 percent above 1987. Poor weather in some areas has likely affected yields of the summer storage crop, but strong spring and summer non-storage production could still leave production near 1987 levels. Prices through mid-August 1988 have averaged a third below the relatively high prices of 1987.

U.S. potato production is expected to decline in 1988 despite strong winter and spring outputs. Drought across much of the nation, in tandem with reduced harvested areas, is expected to have cut production of summer potatoes by 14 percent. The fall crop accounts for about 88 percent of all U.S. potato production. With a 3-5 percent cut in yields compared with 1987, total 1988 potato production could decline at least 5-7 percent. This reduction in production will likely push up potato prices above a year earlier.

In the United States there appears to be a great deal of difference among regions in yields and quality. In the west the crop appears to be generally normal. Mid-western producers experienced good quality but only fair and in some cases poor yields. In the east, yields are a little below normal. In all parts of North America, producer prices are well above last year's level.

CANADA

Fruit

Canadian **apple production** is expected to be 3 percent above the 1987 level and 8 percent above the five-year average. The lower apple supplies in North America will be offset by abundant world supplies and keep apple prices at a relatively low level for the 1988-89 season. Lower world prices for apple juice concentrate could put downward pressure on apple juice prices in Canada.

Ontario's apple crop is estimated at 7.5 million bushels, down 7.9 percent from 1987. This is the smallest crop since 1981. There was some hail damage in Ontario and size will be smaller than normal due to the lack of rain.

Mid-September price was set at $13.80 for 12/3 lb. poly bags and the industry is optimistic for the 1988-89 marketing season. The 1988 juice price was set at $120 per ton, well above the initial 1987 price of $77.50 per ton.

Sweet cherry harvest was estimated at 2.5 million pounds, down 10 percent from 1987. The **Ontario sour cherry crop** declined drastically from 20 million pounds in 1987 to 11.3 million in 1988. Growers received 13.5 cents per pound under the Agriculture.

Stabilization Act to help offset the low 1987 price. Investigations of alleged dumping of the United States crop into Ontario are also under way.

The 1988 **Ontario peach crop** is estimated at 79 million pounds, up 10 percent from last year. The unusually hot and humid summer weather at harvesting caused problems in the marketplace

resulting in lower than usual prices. Pear production decreased 20 to 30 percent from 1987 due to the drought-like conditions.

The **strawberry crop** was variable. Fields that received adequate irrigation maintained fair yields, but many fields suffered large yield reductions due to the drought in southwestern Ontario.

The 1988 **Ontario grape crop** was more severely affected by the long drought than had been forecast. Initial estimates of the crop was 90,000 tons, but harvested production will be closer to 70,000 tons. Tonnage surplus to Ontario processor requirements is now expected to be less than 25,000 tons.

A federal-provincial program that provides $100 million to improve the international competitiveness of the Ontario grape and wine industries includes assistance for grape acreage removal, quality enhancement, price support, and grape and wine development. Specific details are still under discussion.

Vegetables

Contracts for processing vegetable crops will be unfulfilled this year because of the drastic reductions in yields. Peas are estimated to be down 40 percent. Sweet corn, cucumber and bean production is expected to be reduced by at least 20 percent compared to the 1987 crop.

The processed tomato crop was not as bad as expected. Although actual production was down by about 10 percent, the quality, i.e. low water content, was such that recovery will be very close to last year's volume.

Prices for storable vegetables will increase over 1987 levels as the marketing year unfolds. Below average supplies of top-quality vegetables will increase prices, and the relatively strong economy will also contribute to higher prices. The greenhouse industry is slowly expanding. Increased area has offset losses due to the excessive heat of the summer. This scenario is similar for the mushroom industry. These two growing sectors now represent close to 30 percent of the value of all the vegetable crops in Ontario.

Potato supplies in Canada are expected to be reduced due to drought conditions in some parts of the country. A gradual increase in prices is expected, with eastern potatoes for the early fall season in the 13 to 16 cents/kg range. Supplies in western Canada will be lower than average, moving prices higher than last year's levels.

The harvest of the Ontario potato crop is nearly complete. While quality is generally quite good, the Ontario Potato Producers' Marketing Board reports yield reductions of nearly 30 percent.

Processing potatoes are in short supply. Prices are expected to remain firm. The short supply will ensure that producer prices remain firm. Yields in Prince Edward Island and New Brunswick are described as normal to slightly below normal. Quality is generally good.